The training of adult middle-level personnel

by Armin Gretler

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Preface

On the eve of the Second Development Decade, Unesco launched a long-term programme under which, in co-operation with the competent Specialized Agencies, and particularly the International Labour Organisation (ILO), it will contribute to the development of adult education for middle-level personnel.

The need for such training has become increasingly urgent. Industrial and agricultural enterprises are faced with the problem of economic modernization and the reshaping of production patterns and procedures. As they achieve independence, many developing countries recognize that they must reform their national economies and balance the different levels, functions and responsibilities in the various sectors. The lack of middle-level personnel has seriously affected both economic growth and social development.

The present study was commissioned with a view to determining the extent of the problem and identifying and describing the activities and the categories of manpower which belong to the intermediate level. It likewise describes the kind of training involved at this level for the various sectors, provides statistical information and reviews the laws and regulations relating to status and training requirements. A number of training programmes in different countries and regions are discussed.

It is hoped that this comparative study will serve as a source book for research workers, adult educationists, administrators and planners in national and international contexts as well as those specialists concerned with projects for economic development and social integration.

The author, Armin Gretler, who is Secretary-General of the Centre Suisse de Coordination pour la Recherche en Matière d'Éducation, holds degrees in sociology and international studies and has worked as Research Officer in ILO's Vocational Training Branch and for the Institut für Orts-, Regional- und Landesplanung an der Eidgenossischen Technischen Hochschule in Zurich.

The material incorporated in the study represents the author's own choice and the views expressed are not necessarily those of Unesco.

The designations employed and the presentation of the material in this list do not imply the expression of any opinion whatsoever on the part of the Unesco Secretariat concerning the legal status of any country or territory, or of its authorities, or concerning the delimitations of the frontiers of any country or territory.

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Secondly, Professors Frederick Harbison and Charles A. Myers, whose well-known study *Education, Manpower and Economic Growth* provided the basic material for Chapter 2.

Lastly, the International Labour Office's Central Library and Documentation Service, which supplemented the author's sources of information by kindly supplying him with a bibliography compiled with the help of its computer.

Introduction

By virtue of resolution 1.321, adopted at its fifteenth session (1968), the General Conference of Unesco authorized the Director-General 'to support Member States' projects designed to ensure, through adult education programmes, general training for middle-grade personnel' and 'to give technical and financial assistance to appropriate non-governmental organizations for the implementation of projects connected with Unesco's programme and having as their purpose the training of personnel and the strengthening of adult education services and institutions'.

Numerous questions face anyone attempting to translate into action the idea of 'general training for middle-grade personnel'. He will first wish to know which occupations are in fact normally placed in the category of middle-grade—or middle-level—personnel, whether this concept embraces the same occupations in all countries and at all stages of economic development, and so on. Further, if one considers manpower planning as an integral part of economic and social planning, one may wish to know the total number of such personnel at the present time in relation to the total working population, and what role they are destined to play in the future—that is to say, the anticipated rate of growth of the demand for middle-level personnel in countries at different stages of economic development. In the same context of manpower planning—what is and what should be the ratio between numbers of high-level and middle-level personnel? Then, when it is time for action—taking into account these quantitative analyses—it will be important to know what vocational and further training is needed by those who occupy middle-level positions or are to be promoted to such positions. Are these training requirements uniform in character or are they highly varied? Furthermore, once the training requirements are known it will still be necessary to determine which systems or methods of organization can best be adopted. What experiments have been made in different countries with various training formulae? How is the training of middle-level personnel distributed, or how should it be distributed, among the various training institutions? Are data available on the basis of which it is possible to make a systematic evaluation of the different training methods for middle-level personnel? Or does such an evaluation still largely remain to be carried out? A final question: what is the relationship between vocational training and general education as far as middle-level personnel are concerned? The answer to this question depends on which objective one has in view, namely whether one is only considering middle-level personnel in a context strictly limited to manpower problems (does the level of general education within a single occupation affect the productivity of the workers?), or whether one is considering the individual as a complete human being. From this point of view, does the traditional distinction maintained between vocational training and general education still have any meaning? In what way is the relationship between vocational training and general education modified in an environment characterized by accelerating technological development? And so on.

If one seeks answers to these questions at the international level, it is no easy matter to obtain the information on which to base replies: in general, such information is either scattered through articles in specialist periodicals which are often more or less inaccessible, if only for linguistic reasons, or hidden in works not primarily concerned with middle-level personnel. In attempting to provide an inventory of this information, as it were, the present study aims to contribute towards opening the way to more thorough consideration of the subject.

This study should not therefore be regarded as a research report properly speaking, since no basic hypothesis is verified in it. The reader will not find in it any doctrine which is universally valid for the training of middle-level personnel. Rather will he be invited to undertake an imaginary voyage of study from which he will be able to draw whatever lessons seem to him relevant to his own concrete situation.

Chapter 1

Occupations included in the category of middle-level personnel

I. Definitions

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The title of the present study contains two terms which must be defined: that of 'middle-level personnel' and that of 'adult'. While a working definition of the latter raises relatively few problems, we are tackling a very complex field in attempting to define the former.

Definition of 'adult'

For the purposes of this study, 'adult' is defined as anyone who has already entered an active period in life which involves social and economic responsibilities. Full-time apprentices or students are excluded. Adult training is therefore regarded as that provided for a person who has already occupied or who is occupying a dependent or independent position of employment. Two clarifications should be made. The first concerns a particular situation in relation to the two successive periods which we shall call respectively 'education and training' and 'active life'. This is vocational apprenticeship, a system of training which has traditionally been prevalent or is at present in course of being introduced in a number of countries.[1] One of the most striking features of traditional apprenticeship is precisely its role as a transitional stage between the period of education and training and the period of active life. The apprentice belongs to two worlds at the same time: he receives training and he provides productive labour; he is employed in an enterprise and he goes to an educational establishment: he receives pay, but it is appreciably less than the wages drawn by his unskilled fellow-worker of the same age. In certain training systems, for example in Switzerland, it is customary to enter a technical college, which provides full-time teaching extending over several years, immediately after the examination marking the end of apprenticeship. Are we here dealing with the 'training of adult middle-level personnel' or are the young people in question to be regarded on the same footing as university students, in respect of whom one would not normally speak of 'training of adults'?

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[1] See for example: International Labour Office/CIRF (International Vocational Training Research and Information Centre), *European Apprenticeship—Effect of Educational, Social and Technical Development on Apprentice Training Practices in Eight Countries*, Geneva, 1966, 276 p.; Karl Ebel, *Aprendizaje para Jovenes en Seis Países de América Latina* (Apprenticeship for Young People in Six Latin American Countries), Montevideo, ILO/Cinterfor (Inter-American Research and Documentation Centre on Vocational Training), 1967, 85 p.; *Apprenticeship in Asia*, unpublished report by the International Labour Office, Human Resources Department, Vocational Training Branch, Studies and Reports Section, 1968.

The second clarification in this context will only be touched upon here: it will be dealt with more thoroughly in Chapter 7, which is devoted to the prospects for development in the training of adult middle-level personnel. It concerns the general tendency towards the progressive disappearance of a clearly marked break between the two periods of education and training and active life. This tendency, which is not only irreversible as a result of the demands of technical progress but desirable for a whole series of reasons, finds expression, for example, in the concept of 'lifelong training'. It is therefore necessary to bear in mind the fact that the existing system, on the basis of which the term 'adult' has been defined for the purposes of this study, is undergoing change and that the definition adopted will in all probability no longer be adequate in the future. However, this is only one relatively minor consequence of this general process of change, which will undoubtedly affect the concept of adult education itself.

A final point remains to be clarified, if one wishes to remove every possibility of misunderstanding. The term 'middle-level personnel' reveals quite clearly that the framework of reference of the present study is occupational life. There is therefore no question of considering the whole field of adult education.

Definition of 'middle-level personnel'

In all the literature dealing with middle-level personnel or certain categories of such personnel, the difficulty of defining this term is unanimously recognized. No attempt will therefore be made in the following paragraphs to add new definitions to those already in existence or to select one of them as the best. Instead we will endeavour to demonstrate the complexity of the problem and to classify the different criteria on the basis of which a definition can be formulated. The two principal criteria, occupational function and educational level, will be supplemented by an attempted typology. It will emerge from this examination that the concept of 'middle-level personnel' (in French *cadres moyens*) is not static but dynamic and evolutive.

By way of introduction we shall consider two examples which will illustrate from the semantic and conceptual points of view the difficulties inherent in any definition. In the revised edition of the International Standard Classification of Occupations (ISCO), drawn up by the International Labour Office, can be found on page 24 of the French text the heading: 'Classement des Cadres Moyens, des Contremaîtres, des Apprentis et des Instructeurs', which reads as follows in the English version (page 21): 'Notes on Classification of Supervisors, Foremen, Apprentices, and Instructors'.[1] The experts of the International Labour Office have undoubtedly found the best solution of the conceptual and translation problem in the circumstances. The following remarks are in no sense to be regarded as a criticism but as an attempt to point out some of the difficulties inherent in the words. *Cadre moyen* is given here as the French equivalent of the English term 'supervisor', although there is no doubt that these two terms do not correspond exactly in current usage. In current language, the meaning of the term *cadre moyen* is certainly wider than that of 'supervisor'; normally, for example, it includes technicians, who are not necessarily supervisors. Another remark, which this time has nothing to do with questions of translation, but applies in equal measure to the English and the French, is as follows: in the example quoted, the relationship between *cadre moyen* and *contremaître* in the one case and between 'supervisor' and 'foreman' in the other is a relationship between two specific terms, whereas in current usage it is in both cases a relationship between a generic term and a specific term. This is particularly evident in English, where 'foremen' are often called 'first-line supervisors'.

The second example is borrowed from the terminology of Harbison and Myers, who carried out manpower analyses with a view to drawing up strategies for human resource development.[2] One of the terms they employ is that of 'high-level manpower'. This obviously implies the existence of 'low-level manpower'. Does it also imply the existence of 'middle-level manpower'? The following quotation will show that in their first approach Harbison and Myers made no distinction between 'high-level' and 'middle-level' manpower—reasonably enough, in view of their objectives—and that their definition of the first term clearly embraces what it is appropriate to call 'middle-level manpower' or *cadres moyens*:

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[1] International Labour Office, *International Standard Classification of Occupations*, rev. ed., Geneva, ILO, 1969, 355 p.; Bureau International du Travail, *Classification Internationale Type des Professions*, éd. rév., Geneva, ILO, 1969, 415 p.

[2] Frederick Harbison and Charles A. Myers, *Education, Manpower and Economic Growth*, New York, Toronto, London, McGraw-Hill, 1964, 229 p.

Any definition of strategic human capital, or high-level manpower, is bound to be arbitrary. Ours is no exception. But, for analytical purposes, it is necessary to have some definition in terms of both occupations and educational levels. We include the following occupational categories in our definition:

1. Entrepreneurial, managerial, and administrative personnel in both public and private establishments, including educational institutions.
2. Professional personnel such as scientists, engineers, architects, agronomists, doctors, veterinarians, economists, lawyers, accountants, journalists, artists, etc.
3. 'Qualified' teachers, defined as those who have had a minimum of twelve years of education themselves.
4. Subprofessional technical personnel, such as agricultural assistants, nurses, engineering assistants, technicians, senior clerks, supervisors of skilled workers, the highest level of skilled craftsmen, and skilled clerical workers, such as stenographers.
5. Top-ranking political leaders, labour leaders, judges, and officers of police and the armed forces.[1]

As we shall see later, the majority of the occupations which we shall propose to include in the category of middle-level personnel are to be found listed under item 4 of Harbison and Myers' definition, though a number are listed under items 1, 2 or 3. On the other hand it is clear that we shall have to exclude from our category of middle-level personnel all those occupations listed by Harbison and Myers under 'high-level' which normally require a university education.

The main conclusion to be drawn from this quotation from Harbison and Myers is that anyone who wishes to study 'middle-level manpower' would be advised to pay attention also to what can be called 'high-level manpower'. It therefore follows that the bibliography appended to the present study includes documents the titles of which contain the term 'high-level manpower'.

Definition of middle-level personnel according to occupational function. From the point of view of occupational function, two criteria are generally used for the definition of middle-level personnel. The first is that of inspection or checking, supervision and organization, the second that of highly skilled technical activity. In order to indicate an upper limit, we may say that in both cases these functions are performed at a level below that of major decision-making. In terms of hierarchy, the middle-level personnel occupy a position between execution and direction or control (in the sense of the formulation of general policy): 'The intermediary personnel consists of the large category of staff occupying a position between the operatives and skilled employees and the managerial personnel of the establishment.'[1] As we shall see in due course, the functions of checking and highly skilled technical activity correspond very closely to the categories of 'supervisor' and 'technician', which will be considered more thoroughly later.

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[1] Harbison and Myers, op. cit., p. 15–16.

These two criteria seem to be applicable to the entire range of middle-level personnel in so far as one is dealing with the large or medium-scale establishment. They determine the limits of what one may call a narrow definition of middle-level personnel. If, on the other hand, one is dealing with the whole national economy, it is necessary to consider whether it is not appropriate to include two other functions in a wider definition of middle-level personnel. The first, which is particularly important in the economies of developing countries, is that of promotion, extension, popularization. It corresponds, for example, to the activities of those working in the field of community development and popular education in rural areas. When we speak of middle-level personnel from the point of view of human resource development on a national scale, it is generally accepted that these functions of promoting and extending community activities and services should be included in the definition of the term. What has just been said illustrates yet again, if any further illustration were needed, the fact that the definition of middle-level personnel depends on the context and on the objectives envisaged: the management consultant in the United States of America and the human resource planner specializing in developing countries both use the term 'middle-level personnel', while attributing, at least initially, a different meaning to it.

There remains one final function which requires clarification. This is more complex and one may wonder whether it is appropriate to include it in a definition of middle-level personnel. This is the function performed by artisans or other small independent entrepreneurs. It is a polyvalent function for it combines technical skill in a trade with business management at a modest level and the spirit of initiative which the independent worker must show. A further complexity is that, more than the other functions, it includes, in addition to its occupational aspect, a socio-political aspect. This latter aspect was perhaps particularly important in European societies in which the occupational structure was controlled by the guild system, prior to the Industrial Revolution. This is not the place to go deeply into this question or to demonstrate the vestiges of the system which survive in our present civilization and the transformations which it has undergone in the course of history. It will suffice to instance the German term *Mittelstandspolitik*, and the existence in Belgium of a Ministry for the Middle Classes and of a Swiss political party which clearly protects the interests of the 'middle classes' (Bauern-, Gewerbe- und Bürgerpartei). Nor is this the place to examine the role which is played by or could be played by the 'middle classes' in the developing countries. International organizations are studying this question[1] and are giving particular attention to the training of small entrepreneurs in the developing countries. This is also the object of bilateral technical assistance programmes.[2]

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[1] Gino Martinoli, 'I Quadri Tecnici: Cause ed Effetti della loro Insufficienza' (Technical Staff: Causes and Effects of their Shortcomings), in: *La Formazione del Personale nelle Aziende Industriali; Saggi Raccolti a Cura dell'IRI*, p. 171–98, Florence, Vallecchi Editore, 1964.

To sum up, middle-level personnel may be defined on the basis of one, two, three or four occupational functions. According to the context and the objectives being pursued, the definition will be more or less wide. In its widest version the definition of middle-level personnel in accordance with occupational function might be formulated as follows; middle-level personnel include the following categories of worker:

1. Those performing functions of checking, supervision and organization at a level below that of the formulation of general policy.
2. Those engaged in highly skilled technical activity at a level below that of major decision-taking.
3. Those engaged in promoting community activities and extension work.
4. Those working as small artisan entrepreneurs or independent tradesmen.

We shall see in the following section how the definition of middle-level personnel on the basis of educational level can contribute to clarification of the various uncertainties which remain in the definition given above.

Definition of middle-level personnel according to educational level. The relationship between occupations and educational level presents a problem which is well known to human resource planners. It has given rise to two closely linked but distinct kinds of study: empirical research into the educational level actually achieved in certain occupations,[3] and normative works indicating what level would be desirable.[4]

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[1] See for example: X. Gir, 'Interregional Technical Meeting cum Study Tour on Management of Small Enterprises, Turin, 1968', *Training of Managers of Small Enterprises*, Geneva, International Labour Office, 1968, 44 p. (ILO-MAN.DEV/MSE/4).

[2] See for example: Karl Schädler, *Das Handwerk in Togo* (The Artisan Class in Togo), Frankfurt am Main, Studien und Berichte des Forschungsinstituts für Handwerkswirtschaft an der Universität Frankfurt am Main, 1967, 82 p. This analyses the importance of a middle artisan class for the development of Africa.

[3] The most recent and the most complete work in this category of studies is by the Organisation for Economic Co-operation and Development; *Statistics of the Occupational and Educational Structure of the Labour Force in 53 Countries*, Paris, OECD, 1969, 287 p.

See also: P. R. G. Layard and J. C. Saigal, 'Educational and Occupational Characteristics of Manpower—An International Comparison', *British Journal of Industrial Relations* (London), Vol. 4, No. 2, July 1966, p. 222–66; M. A. Horowitz, M. Zymelman and I. L. Herrnstadt, *Manpower Requirements for Planning—An International Comparison Approach*, Boston, Mass., Northeastern University, Department of Economics, 1966, 2 vols.; James Blum, 'Educational Attainment of Occupational Categories of Workers in Selected Countries', in: Herbert S. Parnes, *Forecasting Educational Needs for Economic and Social Development*, see Appendix D, p. 106–7, Paris, OECD, 1962.

[4] Among these works see for example: Herbert S. Parnes, *Forecasting Educational Needs for Economic and Social Development*, Paris, OECD, 1962, 114 p. (cf. Appendix B, p. 78–89, regarding the occupational classification system for the Mediterranean Regional Project); France, Commissariat Général du Plan d'Equipement et de la Productivité, Rapport

In his occupational classification system for the Mediterranean Regional Project, Parnes distributed the 1,345 occupations defined in the original edition of the International Standard Classification of Occupations among four major categories, each of which corresponds to a different educational level.

In attempting to place middle-level personnel in the context of the relationship between occupations and educational levels we shall bear in mind the definition of 'high-level manpower' given by Harbison and Myers and we shall examine its second part, which is concerned with educational levels:

> According to our definition, such persons in the high-level manpower category would normally be expected to have at least a secondary education or its equivalent. [In a footnote the authors add: 'We tend to equate here a secondary education with twelve years of school. In some countries, it consists of only ten or eleven years, and in others it may be thirteen or fourteen. For rough analytical purposes, however, this discrepancy is not too serious.'] Thus, the stock of high-level manpower in a country could be measured by the total number of persons with secondary education or higher in the population. Some of these (i.e. housewives not otherwise employed, the unemployed, the ill or retired) would not actually be engaged in strategic occupations, but the total is a rough indicator of the size of the pool from which persons can be drawn for high-level positions.[1]

If for our own purposes we divide the strategic manpower of Harbison and Myers into high-level personnel and middle-level personnel and identify the former with workers who have received a university training, we reach the following conclusion: middle-level personnel would consist of actively employed persons who had received a secondary education or an equivalent training.[2]

This definition of middle-level personnel by educational level has a certain validity. It can in fact serve, as Harbison and Myers point out, in cases in which sufficiently detailed statistics relating to occupations are

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Général de la Commission de la Main-d'œuvre, *Revue Française du Travail* (Paris), Vol. 20, No. 1, January-March 1966, p. 1-477 (contains hypotheses concerning the training regarded as desirable for each of the occupations under consideration; includes a correspondence table, with six training levels).

[1] Harbison and Myers, op. cit., p. 16.

[2] For a definition of middle-level personnel on the basis of educational level, see also: Robert S. Ray, *The Tools of Manpower Analysis*, cf. p. 3, Geneva, International Institute for Labour Studies, 1967, 10 p.: 'What is middle and high level manpower? The answer to this question is usually framed in terms of the years of formal education and/or training required before an individual can successfully enter an occupation.... Middle level manpower is the term typically used to include those occupations which require a secondary education or its equivalent. In the surveys which have been carried out in East Africa the concept of middle level manpower has been broadened to include the so-called "modern crafts" in which individuals may acquire their experience in on-the-job or other learner programmes after having completed only a primary education in the formal education system. An installer of electronic equipment is an example of such an occupation.'

not available. Moreover, it gives, by and large, an idea of the real state of affairs. It must, however, be stressed that it is only 'by and large' that personnel discharging middle-level functions possess secondary educational qualifications or equivalent training, and that there are many exceptions to this rule. It is, therefore, important to consider the weak points of this definition.

Harbison and Myers themselves are the first to dwell on these weaknesses and on the difficulties entailed in all attempts to apply a system of classifying occupations by relating them to given educational levels. In this respect, middle-level workers do, indeed, constitute a particularly problematic category. Harbison and Myers analyse one such problem in a conclusion in which they show how the educational levels reached in the various occupations are a function of the manpower supply and hence of a country's development level:

> The magnitude of required investments in human resource development for continued growth is itself a function of the level of a country's economic development. A wealthy country has more to spend on education than a poor one, and its citizens demand and get more of it. In the United States, for example, a high school education is now essential for most jobs. In the underdeveloped and partially developed countries, on the other hand, secondary education is an avenue of access to high-level positions in the society. In the less developed countries, only a relatively small proportion of teachers have even the equivalent of a secondary education, while in the advanced countries they are expected to have at least three or four years of higher education. Thus the pre-employment educational requirements for critical jobs depend as much upon the available supply of educated persons as upon precise technical standards. The qualifications required in most occupations, therefore, are a function of a country's general level of human resource development.[1]

The educational level normally reached by workers discharging middle-level tasks is not, therefore, the same in all countries at a given moment. Moreover, the two factors involved, namely the level of skill required for the exercise of a function, on the one hand, and the educational level of the persons applying for certain types of employment, on the other, vary from year to year. The latter factor evolves partly as a function of the former, and party independently. With regard to a specific category of middle-level personnel in the advanced countries, the former case is well illustrated by the titles of two articles listed in the bibliography appended to this study: 'Are College Graduates Better Foremen?' [2] and 'Werden Ingenieure den Meister ablösen'.[3] As regards the latter case, we

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[1] Harbison and Myers, op. cit., p. 185–6.

[2] I. G. Zuev, 'Are College Graduates Better Foremen?', *Factory* (New York), Vol. 125, No. 9, September 1967, p. 78-9.

[3] H. F. Wolf, 'Werden Ingenieure den Meister ablösen?' (Will Engineers Replace Supervisors?), *Arbeit und Arbeitsrecht* (Berlin), Vol. 22, No. 24, December 1967, p. 557–62.

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shall refer to only one of these variations, which threatens to create a problem in the most advanced countries: since the social and cultural demand for education can be increasingly satisfied, the possibility cannot entirely be ruled out that a point may be reached at which the qualifications offered can no longer be fully accommodated in the traditional, hierarchical occupational structure. This is not the place to review potential solutions to such a problem; since it is impossible not to satisfy the legitimately increasing demand for education, the solution may well have to be sought in the direction of a more egalitarian structure of the occupational hierarchy. Within the terms of reference of the present study, which deals with the training of adult middle-level personnel, the question of secondary education as provided by the educational system, in the narrow sense of the term, will moreover only rarely arise. The types of education with which we are here concerned are primarily those which, in the definition we have adopted, are subsumed by the formula 'equivalent training' (i.e. equivalent to secondary education); these are further vocational training, training for promotion and various other similar types of training normally provided during what by convention we refer to as the active or working life.

In conclusion, then, it may be said that the definition of middle-level personnel according to educational level is valid only in so far as it supplements the definition according to occupational function. True, the educational level most frequently associated with middle-level personnel, both in theory and, generally speaking, in practice, is that of secondary education or equivalent training. But this correlation is too inconstant, and there are too many exceptions to it, for it to serve satisfactorily as a basis for definition.

The various types of middle-level personnel

The purpose of this section is to distinguish and to define more closely the four types of middle-level personnel to which we referred above when discussing the occupational functions of this category of manpower, while at the same time emphasizing—above all, in the case of the first two—their complexity.

The 'technician'. In the conspectus of the first six volumes of CIRF Abstracts, it is pointed out in the section devoted to technicians that: 'The almost chaotic situation as regards the scope and content of his title is one of the chief obstacles in the path of recognition of the functions and qualifications of the technician.'[1] The definitions, descriptions of duties and

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1. International Labour Office/CIRF, 'Trends in Training 1961–1967—Six Years of CIRF Abstracts', *Training for Progress* (Geneva), cf. p. 60, Vol. 6, No. 2–4, 1967, p. 1–110.

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tentative classifications which follow—and which have been taken from different countries—will serve to illustrate and to clarify this situation.

In an examination of the causes and effects of the shortage of technical personnel, an Italian author, a well-known expert on the subject, classifies as 'technicians' people occupying such diverse jobs as draftsmen, laboratory research workers, agronomy technicians and personnel responsible for installing automatic plant in offices or factories. All have certain distinctive features in common (a keen interest in practical matters, an attitude of analytical and objective observation and a certain creative spirit). In addition to technicians and supervisors, a further category of intermediate-level workers is distinguished by this author, whom he refers to as 'co-ordinators' (*addetti al coordinamento*). This category comprises persons responsible for dovetailing and co-ordinating the different activities performed in an enterprise; personnel belonging to this category must have open mind and be capable of appreciating other people's points of view.[1]

The function and status of the technician are the product of a relatively recent development. Requirements with regard to engineers are constantly increasing, and the level of training required of them has risen considerably, whereas requirements with respect to skilled workers have increased relatively little. This trend has accentuated the gap between engineers and skilled workers, creating a place for the technician, who thus occupies, in the industrial hierarchy, a position in between these two levels.[2] The fact that this trend occurs at different rates, depending on the scale of the undertaking and varying from industry to industry, is an obstacle to the definition of the technician's status and role. On the one hand, if the firm is small the technician tends to carry the responsibilities of a technologist and to be part of management, whereas in the large firm his duties are usually more narrowly specialized; on the other hand, new industries are more disposed than traditional industries to recognize the technician's role.[3] As will become apparent in the chapter devoted to training, the need to differentiate between high- and middle-grade technicians is making itself felt in a number of countries. According to the description that Krause gives of the technician's duties, he performs tasks of construction and adjustment, plans production, tests and inspects equipment, and is responsible for merchandising, quality control and other specialized operations.[4]

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1. Martinoli, op. cit.
2. Erwin Krause, 'Tätigkeit und Ausbildung von Technikern' (Functions and Training of Technicians), *Wirtschafts- und Sozialpolitik* (Bonn), No. 20, May 1963, special supplement, 10 p.
3. ILO/CIRF, 'Trends in Training 1961–1967 . . .', op cit., p. 60.
4. Erwin Krause, 'Zum Technikerproblem' (The question of technicians), *Wirtschaft und Berufs-Erziehung* (Bielefeld), Vol. 14, No. 4, April 1962, p. 66–9, and 'Tätigkeit und Ausbildung von Technikern', op. cit.

A survey carried out in Ireland details the breakdown of a sample of 474 technicians into eight functional categories, as follows: design and draughting, 64; installation and erection of plant and equipment, 18; operation, maintenance and repair of plant and equipment, 50; inspection, analysis and testing, 93; purchasing and sales, 2; operation and control of manufacturing processes, 170; estimating, rate fixing, work study, 38; laboratory supervision, 7; 'other', 32.[1]

In the United States of America, a distinction is usually made between the engineering technician and the industrial technician:

> Engineering technicians, whose jobs have relatively wide scope and call for a high level of mathematical, scientific and applied technical ability, are usually field-oriented toward one of the major branches of engineering (mechanical, electrical, chemical, aeronautical, construction, electronics, etc.). They are required to have a broad post-secondary education received at a technical institute, junior college, etc. Emphasis is placed on applied technology which will prepare them to assist engineers, scientists or other professionals in the field. Industrial technicians, on the other hand, are 'job-oriented' and operate within a narrower range of activities. Their work centres on specific jobs: inspection, quality control, trouble shooting, etc. Their training may be formal or informal, received in industry or at a vocational technical school. They need less mathematics, science and technology than engineering technicians, but more training and development in manipulative skills.[2]

The concept of a technician seems to be somewhat different in the U.S.S.R. Practical experience appears to play a greater part in his training, such experience often being reinforced by correspondence courses, in-plant training or evening courses.[3] Moreover, it is current practice for Russian technical-school students to qualify for at least the level of first- or second-category worker in some trade or other during their production training. Skilled worker training is in fact considered a necessary preliminary to technician training. On the other hand, technicians in the U.S.S.R. also seem to have functions which go beyond the standard concept of the technician's duties in many other countries, in that they are called upon to organize and control the work of others.[4]

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1. Organisation for Economic Co-operation and Development, *Training of Technicians in Ireland*, Paris, OECD, 1964, 112 p. (*Reviews of National Policies for Science and Education.*)
2. *Technician Education Yearbook: 1963–1964*, Ann Arbor, Mich., Prakken Publications, 1964, 180 p. Quoted in ILO/CIRF, 'Trends in Training 1961-1967 . . .', op. cit., p. 56–7.
3. K. G. Bajkova, 'Večerne-zaočnaja Forma Obučenija' (Sandwich Training, comprising Evening Courses and Correspondence Courses), *Srednee Special'noe Obrazovanie* (Moscow), Vol. 9, No. 1, January 1962, p. 35–7; Ju. A. Bulanov and M. Ju. Zajčik, 'Čto Nado Sokratit' v Učebnyh Planah i Programmah' (How Curricula and Syllabuses should be Curtailed), *Srednee Special'noe Obrazovanie* (Moscow), Vol. 11, No. 7, July 1964, p. 29–33.
4. D. I. Kuprunov, 'Mesto Teknika v Proizvodstve' (The Technician's place in Production), *Srednee Special'noe Obrazovanie* (Moscow), Vol. 13, No. 1, January 1966, p. 1–6.

As will be seen in the chapter concerned with training, considerable practical experience and insistence on the acquisition of skilled worker qualifications also form part of the technician's training in certain non-socialist countries.

The 'supervisor'. It is no more easy to define the supervisor than it is to define the technician:

All research programmes and evaluation projects in the supervisory training field tend to begin by stressing how difficult it is to define the role and functions of a supervisor. ... From the [CIRF] abstracts it is abundantly clear that the job of supervisor cannot be thought of as in any way standardized and that the indiscriminate application of simple standard programmes may lead to failure and waste.[1]

Before discussing the occupational functions of supervisors in detail, it should be stressed that this uncertainty also extends to their social status. The supervisor 'plays an "ambivalent role", identifying himself sometimes with the shop floor and sometimes with management'.[2]

The supervisors' role as part of management leads to a personal conflict of duties. Their indisputable loyalty to the undertaking clashes with their understanding for the needs and desires of their subordinates.[3] Most often, as shown in one of a series of articles in an American reportage on the status, role and functions of the supervisor in industry, their position is felt to be that of the 'man in the middle', between management and workers and not clearly a part of either.[4]

Thus, the problems regarding supervisors can be divided into two major categories: those relating to their social status, and those relating to their occupational functions. Moreover, these latter problems are themselves twofold, depending on whether they are considered from a technical point of view or from the point of view of human relations.

This twofold aspect emerges clearly from the definition adopted by the Committee on Supervisors, set up in Ireland in 1964 by the Department of Labour to examine the adequacy of standards of supervision of

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1. ILO/CIRF, 'Trends in Training 1961–1967 ...', op. cit., p. 49.
2. 'The Training of Supervisors', *BACIE Journal* (London), Vol. 16, No. 1, March 1962, p. 14–20. Quoted in ILO/CIRF, 'Trends in Training 1961–1967 ...', op. cit., p. 50.
3. Erik van Herzeele 'Le Personnel du Cadre Inférieur', *Industrie* (Brussels), Vol. 15, No. 8, August 1961, p. 484–8. Quoted in ILO/CIRF, 'Trends in Training 1961–1967 ...', op. cit., p. 49.
4. ILO/CIRF, 'Trends in Training 1961–1967 ...', op. cit., p. 49–50, referring to I. G. Zuev, 'Man in the Middle', *American Machinist* (New York), Vol. III, No. 13, 19 June 1967, p. 101–42.

operatives in industry, and to put forward policy recommendations designed to remedy any deficiencies observed. Supervisors were defined as being persons

> who are in direct control of workers and who are required to exercise day-to-day control of their work (including both technical and disciplinary aspects) and any subordinates (e.g. assistant foremen, chargehands, etc.) who may assist such persons in carrying out their duties.[1]

In the United Kingdom, a study was carried out in factories operating in five quite different industries, designed to throw more light on the different types of function discharged daily by supervisors. One of the chief objectives of this study was to discover the common features intrinsic to the supervisor's job in each of the various industries. The very definition of the term adopted in this study (supervisor) implies that the role of these senior personnel is to superintend workers and to control the various workshop operations, either by administrative methods (i.e. at a distance) or by actual ‘overseeing” in the area of operations. Three levels of supervisory authority were distinguished: (a) the second-line supervisor (each having several first-line supervisors under him), e.g. supervisor, foreman, senior foreman or shift engineer; (b) the first-line supervisor, e.g. chargehand or foreman; (c) the semi-supervisor, e.g. leading toolsetter, etc.

All the supervisors studied were involved, to a greater or lesser extent, in performing each of four functions: (a) planning production; (b) checking the production process (supervising operatives at work and checking the product); (c) dealing with contingencies (unplanned variations in the product or raw materials, shortages of supplies, faults or breakdowns of machines or plant); (d) acting as a communication link between management and the workers as well as among the other supervisors.[2]

With regard to the skills and qualifications required for all supervisory positions, the conspectus of the first six years of CIRF Abstracts distinguishes, in addition to the technical proficiency required in each particular case, the following: the ability to express oneself, that is, to convey ideas; skill in the human relations field; and a sufficiently broad training to be able to adjust to new situations.[3]

Several articles and studies listed below in the bibliography are, indeed, specifically concerned with this latter aspect: in a report of a field study, published in the United States of America, concerning the restructuring of supervisory job design, the authors discuss the implications of the increasing responsibilities of supervisors in the fields of

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1. Ireland, Department of Labour, *Report of the Committee on Supervisors*, Dublin, Stationery Office, 1966, 72 p.
2. K. E. Thurley and A. C. Hamblin, *The Supervisor and his Job*, London, Department of Scientific and Industrial Research, 1963, 40 p. (*Problems of Progress in Industry*, 13).
3. ILO/CIRF, ‘Trends in Training 1961–1967 . . .’, op. cit., p. 51.

production and quality control;[1] the repercussions of technical progress on the acquisition of occupational skills by industrial supervisors, technical assistants and technicians are analysed in a French article;[2] two reports deal more specifically with the implications of the use of computers for the functions of supervisors;[3] a Soviet article discusses the foreman in his capacity as production organizer and instructor;[4] and an Indian report analyses the role of supervisors in industry in a developing country.[5]

Before concluding, we should do well to consider the position assigned to foremen or supervisors in the International Standard Classification of Occupations (ISCO). According to International Labour Office experts,

> The term 'foreman' most frequently describes a worker's status in his occupation rather than a specific occupation. There are two main classes of foremen, classified differently according to the rules adopted for ISCO. First, there are those foremen who, in addition to assigning, co-ordinating and controlling work performed by a group of workers all performing similar specialized duties (or closely related tasks), participate themselves in executing the work of the group. This type of foreman is usually a craftsman or other experienced specialized worker who does some of the more difficult work and has been given additional duties of allocating work and controlling its execution. From an occupational point of view, he is assimilated with the workers under his control—part of the time he performs the same type of work as they do, at other times he is controlling the execution of such work and his status (as foreman) is dependent on his skill and experience in this particular type of work. Accordingly, he is classified in the same group as the workers under his control. . . .
>
> The other main type of 'foreman' has wider functions and responsibilities. He is generally in charge of an operational unit where workers in various occupations are engaged, sometimes including subordinate foremen. He has organizing, controlling and overseeing functions and normally does not participate directly in execution of the work of the unit. He sees that all the work to be done is allocated to others and plans the work programme, the sequence of operations, the use of machinery, etc. In general, he is akin to 'supervisor' and is classified in ISCO in unit group 7-00—Production supervisors and general foremen.[6]

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[1] L. E. Davis and E. S. Valfer, 'Studies in Supervisory Job Designs', *Human Relations* (Wembley), Vol. 19, No. 4, November 1966, p. 339–52.

[2] C. Vimont and G. Rérat, 'L'Incidence du Progrès Technique sur la Qualification Professionnelle—Le Cas des Agents de Maîtrise, des Agents Techniques et des Techniciens dans l'Industrie', *Population* (Paris), Vol. 22, No. 1, January-February 1967, p. 81–98.

[3] R. Tremmel, 'Meister und Computer' (Supervisors and the Computer), 24 p., and E. Thurley, 'Implications of the Use of Electronic Computers for the Future Roles and Behaviour of Industrial and Construction Supervisors', 25 p., in: *Internationale Arbeitstagung über Automatisierung, Rationalisierung und Technischen Fortschritt*, Oberhausen, 5-8 March 1968. (*Computer und Angestellte*, 3.)

[4] V. Kokuškin, 'Master—Organizator Provizvodstva, Vospitatel'' (The Foreman as Production Organizer and Instructor), *Kommunist* (Moscow), Vol. 40, No. 17, November 1963.

[5] Central Labour Institute (Bombay), *Foremen in Industry*, Bombay, 1966.

[6] International Labour Office, *International Standard Classification of Occupations*, op. cit., p. 22.

The artisan or small independent entrepreneur. Though it is a moot point whether small entrepreneurs are or are not middle-level personnel,[1] it may be taken for granted that small enterprises are destined to play a major role in the economic and social development of the developing countries. They are, as a result, of special concern to the international organizations. For example, Chapter 4 of the ILO report on *Human Resources for Industrial Development* is entitled 'Training for Small Manufacturing Enterprises in Developing Countries';[2] similarly, the participants at the Technical Expert Meeting on the Development of Managerial and Entrepreneurial Resources in Africa, held at Addis Ababa from 5 to 16 December 1966, devoted most of their time to the study of small enterprise development in Africa. The report of this meeting contains, in addition to a whole series of national analyses which constitute an extremely rich store of documentation on this subject, sections dealing with the definition, role and problems of the small enterprise, as well as with legislation governing small enterprises and the means of training for them.[3]

In the study on *Human Resources for Industrial Development*, small industrial enterprises are defined as

> establishments for manufacturing, processing and servicing (installation, maintenance and repair). They differ from large undertakings by a significant lack of specialization in the entrepreneurial, managerial and technical functions. Such small undertakings range from handicraft and cottage industry establishments in which the owner works together with his family to artisan workshops employing hired labour and using simple tools and equipment and the mechanised factory which may employ up to 100 workers. The common denominator between them is that a single working proprietor or manager has to exercise all the entrepreneurial, technical and managerial functions himself, with the help of one or two staff, such as a shopfloor supervisor, a book-keeper or a salesman, at the most.[4]

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[1] See above, the subsection 'Definition of Middle-level Personnel According to Occupational Function'.

[2] International Labour Office, *Human Resources for Industrial Development*, Geneva, 1967, 237 p. (cf. p. 133–58).

[3] *Technical Expert Meeting on the Development of Managerial and Entrepreneurial Resources in Africa, Addis Ababa, 1966. Report*, Geneva, International Labour Office, 1967, 277 p. (ILO *Management Development*, 6).

See also: X. Gir, op. cit.; ILO/United Nations, Commission for Social Development, *Creation of Job Opportunities and Training of Cadres in Countries Undergoing Rapid Modernization*, Geneva, 1967, 66 p. (UN-E/CN.5/422) (contains a section on the training of managers of small enterprises); ILO, *Survey of Management Training Needs and Facilities in Some African Countries*, Geneva, 1965, 77 p. (*Management Development*, 4.) (contains a section on requirements in regard to training of small entrepreneurs); Bert F. Hoselitz (ed.), *The Role of Small Industry in the Process of Economic Growth*, The Hague, Mouton, 1968, 218 p.

[4] International Labour Office, *Human Resources for Industrial Development*, op. cit., p. 133–4.

The following particulars concerning the 'small entrepreneur' are valid primarily with reference to the developing countries, and illustrate the diversity of persons discharging functions of this order. In most developing countries,

> small manufacturing enterprises are established by:
>
> 1. Skilled artisans, such as the village blacksmith and carpenter and the urban motor repair man who combines technical skills, rudimentary business talent and small savings that enable him to expand his workshop gradually into a small manufacturing unit; it is specially in such trades as metal and wood-work and tanning—trades characterized by piece and batch production, where the 'financial threshold of entry' into small-scale industry can be rather low—that small factories emerge from the handicraft sector.
> 2. Merchants who are familiar with the marketing function in industry, and who are generally aware of the opportunities for profit which are the reward of domestic production of consumer goods as an alternative to importation. This group is particularly active in the processing industries, such as soap manufacture and textile weaving, which have a low-to-medium financial entry threshold and do not require great technical know-how for successful operation.
> 3. Landlords and farmers with large holdings, including rural traders who control agricultural output and/or trade and who are frequently engaged in agricultural processing industries such as grain-milling, oil-pressing, cotton-ginning, logging and sawmilling; these industries require a good understanding of produce marketing but rather modest investment and limited technical knowledge.
> 4. A very heterogeneous but far from negligible group: retired civil servants and members of the armed forces with administrative experience and leadership talent; young graduates of technical schools who establish themselves as independent small businessmen, particularly in the modern skill-intensive and technologically progressive industries (such as precision engineering); skilled workers and foremen in large factories with some savings and a desire to branch out on their own; educated persons with a rather specialized technical knowledge (such as pharmacists) that can be profitably invested in small processing units (including the pahrmaceutical and toiletries industries).
>
> This brief summary indicates considerable variety in background and experience of those establishing and operating small enterprises. For many small industrialists, experience accumulated prior to joining the small-scale manufacturing sector relates to technical skills; they do not, however, possess the required complement of marketing knowledge. Others may be experienced in marketing operations, though such experience is not always an appropriate preparation for successful management of an industrial establishment. Others still, with a civil service or military background which has familiarized them with general organization, may have no business acumen. Some groups, like urban merchants, are likely to welcome innovation and change, while small industrialists emerging from the traditional artisan sector are generally more conservative in outlook. This peculiar pattern of entrepreneurial origin, and

the corresponding imbalance in knowledge and skills, will naturally influence the design of training programmes for small industrialists.[1]

The 'activities promoter' or 'extension worker'. This type of worker is distinguished by the fact that he owes his origin not to the demands of 'spontaneous' economic and technological development but rather to a clear and firm determination to promote development. This determination is rooted in a community (local, regional or national, economic or occupational); it is the community, or its leaders, who decide to establish a new kind of function designed to contribute to economic and social development. And it lies with those who instituted it to define this function in terms of their objectives.

To illustrate the range of activities covered by the 'activities promoter' or 'extension worker' category, we shall take, as examples, the following two working definitions: by 'promotion of rural activities' is to be understood any action taken to make rural populations alive to the challenges and benefits of development, while the purpose of 'agricultural extension work' may be said to be to introduce farmers to modern farming techniques; it is, indeed, an essential element of adult vocational training.

II. Classification of occupations belonging to the category of middle-level personnel

We have so far dwelt intentionally upon the complexity of the actual situation, the woolliness of the concepts and the ambiguity of the terms involved. In this second part of Chapter 1 we shall endeavour to present a clear and simple operational solution to the problem of defining middle-level personnel.

The International Standard Classification of Occupations 'provides a systematic classification structure covering the occupations of the whole civilian working population. The classification structure has four levels, providing successively finer detail, as follows: major groups (8), minor groups (83), unit groups (284) and occupational categories (1,506)'.[2] Thus it covers the whole range of occupations. The list which follows is an attempt to identify those minor groups, unit groups or occupational categories included in this classification which can be included among middle-level personnel. It corresponds to the broadest possible functional definition of middle-level personnel; taking into account all that has been said in Part I of this chapter, it can be curtailed, if necessary, by eliminating certain categories which do not correspond to a particular definition adopted by reference to this or that specific objective. We shall consider further the significance of this basic list[1] in Chapter 3 (dealing with statistics on middle-level personnel) and in Chapter 5 (devoted to the training of such personnel).

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[1] International Labour Office, *Human Resources for Industrial Development*, op. cit., p. 134-6.
[2] International Labour Office, *International Standard Classification of Occupations*, op. cit., p. 1.

Professional, technical and related middle-level personnel

Science technicians
0-14 Physical science technicians (3 occupations).
0-54 Life sciences technicians (3 occupations).

Industrial technicians
0-32 Draughtsmen (9 occupations).
0-33 Civil engineering technicians (5 occupations).
0-34 Electrical and electronics engineering technicians (5 occupations.)
0-35 Mechanical engineering technicians (6 occupations).
0-36 Chemical engineering technicians (3 occupations).
0-37 Metallurgical technicians (3 occupations).
0-38 Mining technicians (3 occupations).
0-39 Engineering technicians not elsewhere classified.

Aircraft and ships' officers
0-4 Aircraft and ships' officers (3 unit groups, 14 occupations).

Middle-level medical personnel
0-62 Medical assistants (1 occupation).
0-64 Dental assistants (3 occupations; dental prosthesis makers and repairers and dental chair-side assistants, 'who help the dentist in his consulting room at the chair-side by preparing and taking care of instruments and other dental equipment, preparing materials and looking after the welfare of patients', are not classified in this unit group).
0-66 Veterinary assistants (1 occupation).
0-68 Pharmaceutical assistants (1 occupation).

The following unit groups may possibly be classified together with middle-level medical personnel:
0-69 Dietitians and public health nutritionists.
0-71 Professional nurses.
0-73 Professional midwives.
0-75 Optometrists and opticians.
0-76 Physiotherapists and occupational therapists.
0-77 Medical X-ray technicians.

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[1] Readers who are interested in the connotation of the listed occupations will find detailed descriptions of the duties pertaining thereto in the International Standard Classification of Occupations.

Various categories of teachers

1-33 Primary education teachers.
1-34 Pre-primary education teachers.
1-35 Special education teachers.

It is a moot point whether the unit group '1-32 Secondary education teachers' should be included as middle-level workers.

Other professional, technical and related middle-level personnel

0-84 Statistical and mathematical technicians (2 occupations).
1-1 Accountants (3 occupations).
1-93 Social workers (6 occupations).

It is a moot point whether certain other unit groups and occupations included in the minor group '1-9 Professional, technical and related workers not elsewhere classified' should be included as middle-level personnel, as for example the following:

1-91 Librarians, archivists and curators.
1-94 Personnel and occupational specialists.
1-95.30 Translators.
1.95.40 Interpreters.

Clerical and related middle-level personnel

Clerical supervisors

3-0 Clerical supervisors (2 occupations).

Government executive officials

3-1 Government executive officials (1 occupation).

Transport and communications supervisors

3-5 Transport and communications supervisors (3 unit groups, 14 occupations).

Middle-level sales workers

4-2 Sales supervisors and buyers (2 unit groups, 5 occupations).
4-31 Technical salesmen and service advisers (2 occupations).

Middle-level service workers

5-2 Housekeeping and related service supervisors (6 occupations).

Middle-level agricultural and forestry workers

6-00.30 Farm supervisors.
6-32.20 Forest supervisors.

Production supervisors and general foremen

7-0 Production supervisors and general foremen (12 occupations).

'Middle grades'

Agricultural middle grade
6-1 Farmers (2 unit groups, 8 occupations).

Commercial and service middle grade
4-1 Working proprietors (wholesale and retail trade) (2 occupations).
5-1 Working proprietors (catering and lodging services) (5 occupations).

Independent artisans

The term 'artisan' is not used in the International Standard Classification of Occupations. Independent artisans could be classed under the following headings:

2-1 Managers, a minor group comprising workers who 'plan, organize, co-ordinate and direct public and private industrial, commercial, public utility, transport, communications and other undertakings, establishments and organizations (or one or more of their departments)'.[1]

This minor group 'includes all workers and working proprietors mainly performing management functions' (with certain exceptions).

3 to 7/8/9 Classified in these major groups are 'those workers who have the status of working proprietor or who have special titles, including such terms as "chief", "director" or "manager", but who do not principally carry out duties within the scope of the functions of management',[2] that is, 'those who, with or without the assistance of other workers, principally perform functions described in the definitions of the various crafts and trades, and personal service, supervisory and other occupations covered by those major groups'.[2]

This last example brings out clearly the limitations of our attempt to formulate an operational definition of middle-level personnel using the categories on which the International Standard Classification of Occupations is based. These categories are defined strictly in terms of the functions discharged, whereas the very term 'middle-level personnel' introduces a hierarchical element which cannot always be included without ambiguity in the function itself. There are other border-line cases, as for example the minor groups 4-0 (Managers, wholesale and retail trade), 5-0 (Managers, catering and lodging services) and 6-0 (Farm managers and supervisors), which cannot easily be given a place in our scheme without knowing the size of the enterprises concerned and the number of personnel they employ.

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[1] *International Standard Classification of Occupations*, op. cit., p. 94.
[2] ibid., p. 95.

Middle-level personnel and human resources development strategies

The purpose of this short chapter is to show that, in order to determine the precise role which middle-level personnel are to play in a country's development, it is essential to situate them in the broader context of that country's total manpower. In this respect, the distinction currently drawn between the so-called developing and the developed countries proves to be far too rough and ready. We shall, accordingly, adopt the more finely graded terminology employed by Harbison and Myers,[1] who identify the following four development levels: (a) Underdeveloped countries (Level I); (b) Partially developed countries (Level II); (c) Semi-advanced countries (Level III); (d) Advanced countries (Level IV).

These authors have sought to devise human resources development strategies for each of these levels. Their conclusions with regard to middle-level personnel and adult training are summarized in this chapter.

The criterion adopted by Harbison and Myers so as to arrive at their classification into four levels is a composite index of human resources development. This composite index is 'simply the arithmetic total of enrolment at second level of education as a percentage of the age group 15 to 19, adjusted for length of schooling, and enrolment at the third level of education as a percentage of the age group, multiplied by a weight of 5'. The choice of this weight factor has been criticized as arbitrary. The reasons which the authors put forward for adopting it are not, in fact, wholly convincing. They merely say that, in their judgement, 'higher education should be weighted more heavily than second-level in such an index. A weight of 10 and a weight of 3 gave somewhat different results, but not significantly different'.[2] Another criticism of this composite human resources development index is that it provides a yardstick, not of the stock of manpower possessing a particular educational qualification, but rather of additions to it. This criticism is to be set alongside an observation which should be made within the context of the present study: not only do Harbison and Myers measure additions to the manpower stock; they also base their analysis on educational levels and not on the occupational functions actually discharged.

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[1] Harbison and Myers, *Education, Manpower and Economic Growth*, op. cit.

[2] ibid., p. 32.

On the basis of their composite human resources development index, Harbison and Myers classified seventy-five countries for which the requisite data were available. These countries break down into the four development levels as follows: Level I (underdeveloped countries), 17; Level II (partially developed countries), 21; Level III (semi-advanced countries), 21; Level IV (advanced countries), 16.

The authors then studied the correlations between the indicators of human resources development and those of economic development. The following are their most important conclusions on this subject:

1. There is a very high positive correlation between the composite index of human resource development and GNP per capita in United States dollars (.888), and a very high negative correlation between the composite index and the percentage of the active population engaged in agriculture (-.814).
2. There are also high correlations between the adjusted second-level enrolment ratio and GNP (.817) and percentage engaged in agriculture (-.835). The correlation coefficients of these economic development indicators with the third-level enrolment ratio (unweighted) are somewhat lower but still significant (.735 and -.675).
3. Correlations between the first-level enrolment ratio and GNP (.668) and percentage in agriculture (-.775) are lower than the correlations of either the composite index or the second-level enrolment ratio with GNP and percentage in agriculture. This tends to fortify our earlier conclusion that an index based on higher levels of education correlates more significantly with measures of economic development than one based on the lowest level of education.[1]

As a general conclusion, then, we may take it that the composite human resources development index (based, as we have seen, on additions to the stock of manpower with secondary or higher education) does indeed express the level of economic development and that 'human resource development may, therefore, be a more realistic and reliable indicator of modernization or development than any other single measure'.[2]

We must now study the four levels of human resources development, with special reference to the findings and conclusions relating to strategies in respect of middle-level personnel and adult education. A certain number of manpower reports listed below in the Bibliography will be presented to support our discussion of each development level.

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[1] Harbison and Myers, *Education, Manpower and Economic Growth*, op. cit., p. 40.
[2] ibid., p. 14.

Underdeveloped countries

Without going into details concerning the economic, social and political structures of the underdeveloped countries, some of their most salient features will be singled out here for attention. These countries are predominantly agricultural. 'The vast majority of the population is rural or nomadic ... engaged in subsistence activities.' The so-called modern sector of the economy is extremely small; it consists of the government departments and a few large plantations and industrial undertakings.

> The GNP per capita with few exceptions is very low, the annual average being less than $85 per capita ... [The] 'employed labour force', meaning those persons who are in some way connected with the market rather than the subsistence economy, is a very small proportion of the total population.[1]

There is generally a shortage of all categories of highly skilled manpower. Such countries lack university graduate manpower, but the dearth of middle-level personnel is even more critical. For example, engineers are in very short supply, but engineering technicians are even more scarce; there is a serious shortage of doctors, but an even more critical need for medical technicians and nurses.

The strategy of human resources development devised by Harbison and Myers for underdeveloped countries includes the following elements (those of special relevance to the subject of this study will be analysed in greater detail):

Formulation of a programme of 'localization' for middle- and high-level personnel.

Formulation of a comprehensive programme for training and upgrading employed adult manpower. Since highly skilled manpower cannot be expected to spring full-blown from the various educational establishments, private enterprises and government departments must assume most of the responsibility for lower- and middle-level technical training. In other words, the most highly skilled workers in private enterprises and government departments must devote some of their time to training their personnel.

> In any case, it is much more important for the Level I countries to concentrate on effective programmes of in-service training than on construction of vocational and technical schools, which would require in most cases high-cost expatriate teaching personnel and expensive facilities which are far beyond the limited resources of these countries.

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[1] Harbison and Myers, *Education, Manpower and Economic Growth*, op. cit., p. 49–51.

The large industrial or commercial enterprises, particularly those which are managed by expatriates, can be excellent producers of skilled manpower.

> For example, the petroleum and mining companies usually are able to train craftsmen and local supervisors in remarkably short periods of time. They may also be used to develop persons for middle and top management. Frequently, many of the persons who get training in these enterprises leave their employment to set up machine shops [or other types of small enterprise].

In addition, each ministry should have its own training organization.

Formulation of an appropriate compensation (remuneration) structure for highly skilled manpower.

Development of a 'crash programme' to extend and improve education with special emphasis on the quality and efficiency of such education.

Absolute priority to be given to secondary education.

With regard to higher education, the sending of large numbers of students abroad.

Formulation of a programme of formal adult education.

> This is particularly important in the Level I countries because of the deficiencies in all other kinds of education. In addition to the previously mentioned in-service training programmes ... this programme should include agricultural and co-operative extension work, fundamental education, and other organized programmes to enable men and women to participate more effectively in their country's development.[1]

Included in the bibliography appended to this study is a series of manpower reports relating to Level I countries. One group is made up of working papers presented at the East African Seminar on Labour Problems in Economic Development, held at Nairobi in April 1967 by the International Institute for Labour Studies,[2] while a second group comprises studies compiled and edited by Harbison and Myers in another volume.[3]

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[1] Harbison and Myers, *Education, Manpower and Economic Growth*, op. cit., p. 62–71.

[2] International Institute for Labour Studies, *East African Seminar on Labour Problems in Economic Development, Nairobi, 1967*. Studies were presented at this seminar for the following Level I countries: Ethiopia, Kenya, Malawi, Sudan, Tanzania, Uganda and Zambia. These studies included statistical appendixes relating in particular to the then current middle- and high-level manpower stock, defined by educational level, and to future requirements in this respect.

[3] Frederick Harbison and Charles A. Myers, *Manpower and Education—Country Studies in Economic Development*, New York, Sydney, Toronto, London, McGraw-Hill, 1965, 343 p. This volume contains studies relating to the following Level I countries: Guinea, Ivory Coast, Nyasaland (Malawi), Senegal and Uganda.

Partially developed countries

The economic and social characteristics of partially developed countries which are of special relevance to this study are the following; their economy is primarily an agricultural one:

> On the average, about 65 per cent of the active population is engaged in agriculture, as compared with 83 per cent in the Level I countries. And in most countries a rather large proportion, but probably less than half of the rural population, may be engaged in subsistence activities. ... In all of the Level II countries, there is a nucleus of modern industry. ... Banking and commercial establishments are much more developed than they are in the Level I countries, as are the systems of transportation and communication. Thus, the modern sector in the partially developed country is larger and a great deal more complex than that in the Level I country, and government employment no longer dominates the labour market. ...
>
> The average partially developed country has a GNP per capita of about $180, roughly twice that of the Level I countries.[1]

With regard to enrolment ratios at the different levels, it is extremely interesting to note that

> there is a somewhat greater relative quantitative difference between Level I and Level II countries than there is between those in Level II and those in Level IV.[2]

This fact accentuates the need to introduce finer distinctions than that currently drawn between 'developing' and 'developed' countries.

The most distinctive feature of manpower problems in the typical Level II country is that scientific, professional and technical personnel of all kinds are in very short supply, and the most critical shortages are to be found in the subprofessional or middle-level categories such as engineering and agricultural technicians, nurses and medical assistants, secondary school teachers, industrial supervisors and senior craftsmen.[3]

The strategy of human resources development devised by Harbison and Myers for the partially developed countries comprises the following elements (those of special relevance to the subject of this study will be analysed in greater detail):

Priority probably to be given to the expansion and reform of secondary education.

The orientation of general secondary education to be changed.

> Its purpose should be to provide a fundamental and broad education, including adequate exposure to science and mathematics, for students

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[1] Harbison and Myers, *Education, Manpower and Economic Growth*, op. cit., p. 74–5.

[2] ibid., p. 73.

[3] ibid., p. 75–6.

> planning to take jobs directly . . . [in middle-level occupations] or to enter the universities.

The output of the agricultural, scientific and engineering faculties of the universities to be expanded in both relative and absolute terms; upgrading of the status and increase in the remuneration of scientists and engineers so as to draw more young people to these careers.

Inasmuch as the greatest need is for subprofessional personnel such as agricultural and engineering assistants, secondary school science teachers and medical assistants, new approaches must be devised to the training of such personnel.

> The universities may offer such training at a junior college level; polytechnic institutions may be established; various government ministries and large private employers can develop specialized technician training programmes of their own. No matter what combinations are used, however, subprofessional training needs to be geared as closely as possible to actual employment, and should be available on a part-time basis for those already working in government and private establishments.

Expansion and improvement of primary education.

Participation of local communities in the construction of primary school buildings.

Upgrading of manpower which is already employed. 'In the Level II countries the need for part-time training and adult education programmes is particularly great', since many middle- and high-level personnel are inadequately qualified. The secondary school leaver

> needs part-time training to become a technician, and the technician should be able to pursue part-time studies at the university level to attain full professional status. . . . Agricultural extension services and community development programmes are urgently needed. Thus, in the Level II countries the secondary and higher education institutions should probably devote as much time and resources to part-time programmes for adult manpower as to full-time pre-employment education.[1]

Most of the reports dealing with manpower and strategies of human resource development in Level II countries that are listed below in the Bibliography have been taken from the collection of studies edited by Harbison and Myers to which we have already referred.[2]

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[1] Harbison and Myers, *Education, Manpower and Economic Growth*, op. cit., p. 95–9.

[2] Harbison and Myers, *Manpower and Education . . .*, op. cit. With regard to Level II countries, this volume contains studies on the People's Republic of China, Indonesia, Iran and Peru.

See also: A. Abreu, *Valorização dos Recursos Humanos, Dados para una Abordagem do Problema* (Evaluation of Problems concerning Human Resources: Background Materials for a Approach to the Problem), Florianopolis, 1964, 102 p. (Documento preparado para o Primeiro Seminario Latino Americano de Formação Profissional).

Semi-advanced countries

The characteristics of the economic and social structure of the semi-advanced countries which are of particular importance for our study can be summarized tentatively as follows:

> Industrialization is well advanced in Level III countries. . . . Only about half of the active population is employed in agriculture. . . . In the non-agricultural sector, government is no longer the largest employer of skilled manpower. . . . The average Level III country has a GNP per capita of $380, or about one-third the average of the advanced countries in Level IV and twice as much as in Level II.[1]

Level III countries are becoming largely self-sufficient in providing for their own needs of highly skilled manpower, with the possible exception of certain categories of scientific and technical manpower. Some of these countries, indeed, are faced with a surplus of university graduates since, unlike the advanced countries, their level of economic development is still not high enough to absorb all those finishing higher education, regardless of field of study.[2]

The strategy of human resources development worked out by Harbison and Myers for the semi-advanced countries comprises the following elements (those of special relevance to the subject of this study will be analysed in greater detail):

Reorientation of higher education, with top priority given to scientific and technical education (including agriculture).

Establishment of research institutes in science and technical fields; policy decisions regarding the difficult problems caused by combined population pressure and mass unemployment.

Improvement in the quality and orientation of secondary education; more responsibility to be placed on employing institutions for training those who do not go on to higher education. These efforts may be expanded even further than in the earlier levels of development, since an advancing industrial society requires a variety of skills which can only be developed adequately on the job.

Expansion (in certain cases), but above all improvement of the quality and efficiency of primary education.

Changes in the structure of incentives for 'seed-corn' positions such as teachers, agricultural extension workers and community development officers, as well as other highly skilled occupations.[3]

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1. Harbison and Myers, *Education, Manpower and Economic Growth*, op. cit., p. 102–3.
2. ibid., p. 108.
3. ibid., p. 125–9.

Included in the Bibliography appended to this study are a number of reports dealing with manpower and strategies of human resources development in the semi-advanced countries.[1]

Advanced countries

From a brief analysis of the economic and social structure of the advanced countries the following features of special relevance to our study can be singled out as being characteristic:

> The typical country in the fourth level of human resource development is an advanced industrial economy. It is capable of making major scientific, technological and organizational discoveries and innovations. ... The average Level IV country has a per capita GNP nearly three times higher than that in Level III, and thirteen times higher than that in Level II. ... Agricultural productivity in most of these countries is high ... and consequently the proportion of the active population engaged in agriculture is generally less than 25 per cent. ... In many of these countries an increasing proportion of the labour force is employed in tertiary occupations, and a declining percentage (relatively) in the 'industrial' sector, comprising manufacturing, mining, construction and transportation[2].

Most Level IV countries have a relatively large stock of highly qualified human resources. Nevertheless, many advanced countries encounter shortages in some of these categories (in particular, of teachers at most levels, engineers, scientists and technicians).

Some of the manpower resources in these advanced countries are undoubtedly under-utilized, but generally there is no problem of 'labour surplus' to the degree found in less developed societies.[3]

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[1] Morris A. Horowitz, 'High-Level Manpower in the Economic Development of Argentina', Rudolph C. Blitz, 'The Role of High-Level Manpower in the Economic Development of Chile' and William H. Knowles, 'Manpower and Education in Puerto Rico', in: Harbison and Myers, *Manpower and Education* ..., op. cit., p. 1–36 (Horowitz), 73–107 (Blitz), 108–39 (Knowles); Commissione d'Indagine sullo Stato e lo Sviluppo della Pubblica Istruzione in Italia, 'Sintesi della Relazione presentata al Ministro della Pubblica Istruzione dalla Commissione d'Indagine sulla Scuola' (Summary of the report submitted to the Minister of Education by the Commission of Inquiry into Schools), *Scuola e Città* (Rome), Vol. 14, No. 10, October 1963, p. 524–7; United Nations, Economic Commission for Africa, *Manpower Requirements and the Training of Technical and Managerial Personnel in the UAR*, Addis Ababa, 1965, 24 p. (presented by the Government of the United Arab Republic (UN-E/CN.14/AS/III/6/1).

[2] Harbison and Myers, *Education, Manpower and Economic Growth*, op. cit., p. 131–3.

[3] ibid., p. 138.

The strategy of human resources development worked out by Harbison and Myers for the advanced countries comprises the following elements (those of particular importance for our study will be discussed in greater detail):

Need for considerable improvements in the quality of higher education, particularly at the post-graduate level, in view of the particular shortage of highly skilled manpower in certain fields.

Need to reduce the gap between science and technology and the humanities at the higher educational level.

More effective utilization of highly skilled manpower (and establishment of a more balanced ratio of middle-level workers to high-level workers).

Application of policies to encourage a high rate of economic growth and to develop a more versatile labour force.

Reform of secondary education curricula. Account must be taken of the fact that access to secondary education will no doubt soon be considered a universal right.

The need to take into account the social pressure for broader access to higher education.

Development of adult education, which is no less necessary in the advanced countries than it is in the less developed ones. This will involve retraining and educational programmes of various kinds. Mid-career training and retraining programmes will undoubtedly increase in importance as the additions to new knowledge increase the obsolescence of skills and knowledge acquired in earlier years. Professions and skills become out of date more rapidly in the advanced society, and the human tragedies of displacement and consequent waste of human resources can be minimized by programmes for updating knowledge or developing new skills. Employing institutions will bear a substantial part of the total cost of these programmes, by providing on-the-job training or financing special projects. But there is also a broader public responsibility when better utilization of human resources benefits the entire society.

The need to correct some distortions in the incentive structure for certain occupations.[1]

The report of the Manpower Committee, prepared in connexion with the French fifth national economic plan provides an excellent example of an analysis dealing with manpower and strategies of human resources development in the advanced countries.[2]

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1. Harbison and Myers, *Education, Manpower and Economic Growth*, op. cit., p. 168–71.
2. France, Commissariat Général du Plan d'Équipement et de la Productivité, 'Rapport Général de la Commission de la Main-d'œuvre', *Revue Française du Travail*, op. cit.

Conclusions

Before attempting to draw conclusions concerning the strategic importance of middle-level personnel and the training of adult middle-level workers at the various development levels, it may be helpful to draw the reader's attention to a few other works which emphasize different aspects of the need to view middle-level personnel in the broader context of analyses of human resources development strategies. In contrast to the studies referred to in the four previous sections of this chapter, these works do not deal with one specific country but rather with groups of countries or particular economic sectors. The reader may accordingly consult with advantage the following publications:

Costa, Émile. Practical aspects of the organization of manpower utilization and education schemes in the developing countries. *International labour review* (Geneva), vol. 93, no. 3, March 1966, p. 248–80.

Dumont, René. *Développement agricole africain*. Paris, Presses Universitaires de France, 1965. 223 p. (Études 'Tiers Monde'). Contains proposals regarding agricultural instruction at the intermediary and higher level and agricultural extension work.

Hunter, Guy. Issues in manpower policy: some contrasts from East Africa and Southeast Asia. In: Harbison and Myers, *Manpower and education . . .*, op. cit., p. 325–43.

Institut de Science Économique Appliquée (Paris). *Rencontre internationale sur la planification de l'encadrement dans les pays sous-développés. Travaux*. Paris, ISEA, 1965. 127 p.

International Labour Office/UNIDO. Education and training programmes for industrialization. *International Symposium on Industrial Development, Athens, 1967*. New York, N.Y., UNIDO, 1967. 80 p.

Malassis, L. *Economic development and the programming of rural education*. Paris, Unesco, 1966. 59 p. (NS.65/D.41/F.)

Tevoedjre, A. *Contribution à une synthèse sur le problème de la formation des cadres africains en vue de la croissance économique*. Paris, Diloutremer, 1965. 152 p.

The following conclusions may be drawn from the information brought together in this chapter.

Middle-level workers play an important role at all stages of development. However, the shortage of this category of manpower gives rise to a particularly serious bottleneck—the most critical point, in fact, of human resources development—in Level I and Level II countries. This shortage extends to all categories of middle-level personnel: industrial and agricultural technicians, secondary school teachers, medical assistants and nurses, administrators and sales workers, and industrial supervisors. There is a crucial need, given the scale of the agricultural sector in these countries, for middle-level agricultural workers and community development officers. Of the various types of training, further training of employed adult workers has still a long way to go, qualitatively and quantitatively, before it meets the needs and plays the role it should. It is, therefore, necessary to do all that can be done in this field, including the development of on-the-job training and part-time courses provided by appropriate educational institutions. The various types of employer will also be called upon to play a more prominent part in such training.

Level III countries suffer primarily from a shortage of middle-level scientific and technical workers. Employers should assume a greater share of responsibility in the further training of workers who, having completed secondary education at the time of taking up employment, could occupy middle-level positions.

As regards the training of adult middle-level personnel in the advanced countries, this is frequently a matter of updating knowledge and skills or retraining for a different type of work.

Chapter 3

Statistics relating to middle-level personnel

Establishing statistics on a certain subject presupposes that that subject is first defined. As we have seen in Chapter 1 however, we are still, as far as middle-level personnel are concerned, a long way from possessing a definition that is universally considered valid. As a result, experts in manpower problems maintain that uniform and internationally comparable statistics on middle-level personnel do not exist. Harbison and Myers, for example, note that manpower reports which differentiate between middle-level workers and high-level workers are available for only a handful of countries—and that such statistics are, moreover, of variable quality.[1] Manpower reports have, admittedly, become considerably more numerous since the publication of these authors' work, but as regards the crux of the matter—i.e. the definition of middle-level personnel, which is a *sine qua non* of all reliable statistics—the situation has not changed fundamentally. Similarly, the authors of the conspectus of the first six volumes of CIRF Abstracts note that the extent to which technical and supervisory staff are in short supply in the developing countries is difficult to assess for lack of adequate statistics.[2] It was in view of this state of affairs that we dwelt at such length in Chapter 1 on problems of definition, possible solutions and, in particular, the attempt to determine what categories of the International Standard Classification of Occupations might properly be included among middle-level personnel.

The most comprehensive source of manpower statistics, the *Yearbook of Labour Statistics*, published by the International Labour Office,[3] (ILO) is of no service in identifying middle-level personnel, as it classifies manpower by reference to the ISCO major groups, whereas for our present purposes it is essential, as we have seen, to proceed in 'descending' order to the minor groups, the unit groups and sometimes even to the occupational categories. At present, the only available means of drawing up uniform, complete and internationally comparable statistics on middle-level

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1. Harbison and Myers, *Education, Manpower and Economic Growth*, op. cit., p. 25.
2. ILO/CIRF, *Trends in Training 1961–1967* ..., op. cit., p. 57–8.
3. ILO, *Yearbook of Labour Statistics*, 28th issue, Geneva, 1968, 757 p.

personnel appears to be the following: firstly, middle-level personnel must be defined in terms of ISCO minor groups, unit groups and occupations (as was attempted in Chapter 1 of this study); the ILO statistical department should then be able to establish country manpower totals for each of the categories thus identified.

A work recently published by the Organisation for Economic Co-operation and Development (OECD)[1] contains some internationally comparable statistics which are extremely interesting but, once again, they do not allow us to identify all middle-level workers as defined according to occupational function. If, on the other hand, we abide by the definition of middle-level personnel according to educational level, the statistics compiled in this volume are of the greatest use. Table II, 'Occupations by Education', even makes it possible to go one step farther. For certain countries this table is, in fact, broken down into three major parts: 'IIA. Occupation by Education. All Major Occupational Groups'; 'IIB. Occupation by Education. Minor Occupational Groups in Major Groups O and I'; and 'IIC. Occupation by Education. Selected Professional Occupations'. These tables make it possible to identify certain categories of middle-level personnel by combining the two criteria discussed in Chapter 1 above (occupational function and educational level). A detailed analysis of these tables might prove useful for purposes of establishing internationally comparable statistics on middle-level personnel. Such an analysis, however, lies beyond the scope of the present study.

Certain countries distinguish, in their population censuses, not only occupations, but also the hierarchical positions within each occupation. As is shown by the example of Switzerland, this distinction is not, unfortunately, in itself enough to ensure that it will be possible to identify the middle-level personnel. With regard to 'occupational position' official Swiss statistics in fact distinguish the following categories:[2] independent persons; directors and managers; senior technical employees; other senior employees; junior technical employees; other junior employees; home-based workers; skilled workers; semi-skilled workers; unskilled workers; trainees in the arts and crafts; trainee sales workers.

It will be noticed that it is precisely the middle-level category which this classification system fights shy of, such personnel being divided among 'senior employees' and 'junior employees'.

Having made these reservations and pointed to possible approaches to the task of establishing internationally comparable statistics on middle-level personnel, we shall proceed as follows. For each development level, two countries will be selected for purposes of illustration. In certain cases,

[1] OECD, *Statistics of the Occupational and Educational Structure of the Labour Force in 53 countries*, op. cit.

[2] Switzerland, Eidgenössisches Statistisches Amt, *Eidgenössische Volkszählung 1960—Verzeichnis des persönlichen Berufe* (Federal Census of the 1960 Population—Register of Individual Occupations), Bern, ESA, 1961, p. 24.

the statistics relating to middle-level personnel will be supplemented by requirement forecasts. In addition to information concerning the two countries selected, miscellaneous fragmentary statistical data will be provided concerning countries at the same development level. Particular attention will be paid to the ratio of middle-level (or subprofessional) to high-level (or professional) workers.

Underdeveloped countries

The two countries selected at this development level are Kenya and Uganda.

Statistics relating to middle-level personnel in Kenya

In a manpower report made in Kenya in 1964,[1] the following four categories of middle- and high-level personnel were distinguished: A. Occupations for which a university or higher education is required; B. Occupations for which a university degree is not essential; C. Technicians and clerical staff who have received a secondary education or some form of vocational training; D. Skilled manual workers.

Until 1964, all these four categories together made up less than 10 per cent of the total—or 19 per cent of the non-agricultural—manpower stock. It was planned that the labour force comprised by these four categories would rise from 69,000 in 1964 to 106,100 in 1970, corresponding to an annual rate of increase of 7·4 per cent.

In 1964, 65 per cent of this labour force belonged to category C (Africans representing 45·6 per cent only of this figure); but, despite this high percentage, the over-all demand for this category of worker could not be met. The most serious shortage, however, was in regard to category B workers; and the annual rate of increase of this category was supposed to reach 16 per cent between 1964 and 1970.[2] It will be noted that, in this system of classification, categories B and C constitute what might be termed middle-level personnel proper.

Despite all efforts made, there were still expected to be shortages in 1970, particularly with regard to technicians and other middle-level personnel (1,100 nurses, 1,000 agricultural technicians, 700 accountants, 900 industrial technicians) and certain skilled clerical workers (19,000 in all).[3] Table 1 summarizes the situation and at the same time illustrates the problems of Africanization.

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[1] Kenya, Ministry of Economic Planning and Development, *High-level Manpower Requirements and Resources in Kenya, 1964–1970*. Nairobi, East African Institute Press, May 1965.

[2] *Labour Problems in the Economic and Social Development of Kenya*, Geneva, International Institute for Labour Studies, 1967, 27 p., annexes (mimeo.) (Working Paper No. 2 of the East African Seminar on Labour Problems in Economic Development, Nairobi, 1967) (EAS/67/WP/2); cf. p. 11.

[3] ibid., p. 12.

Table 1. Employment (1964) and estimated requirements (1970) of high-level manpower in Kenya

Category	1964							1970 (all races)			
	Europeans		Asians		Africans		Total	Employment (estimated)	Extra needs, 1964–70	Supply, 1964–70	Shortfall
	Number	%	Number	%	Number	%					
Professional and top management	3,267	50·4	1,745	26·9	1,476	22·7	6,488	9,968	5,611	4,637	974
Technical and semi-professional	1,890	14·7	1,229	9·6	9,696	75·7	12,815	31,213	23,814	18,975	4,839
Skilled office and middle and lower management	5,546	17·3	13,270	41·4	13,170	41·3	31,986	41,272	17,830	1,798	16,032
Highly skilled manual	1,112	8·5	4,570	35·0	7,389	56·5	13,071	25,018	7,128	2,226	4,902
Other qualified artisans	97	2·0	796	16·5	3,937	81·5	4,830		2,732	348	2,384
Total	11,912	17·2	21,610	31·2	35,668	51·6	69,190	107,471	57,115	27,984	29,131

Source: Robert Gavin, 'Correcting Racial Imbalance in Employment in Kenya', *International Labour Review* (Geneva), Vol. 95, Nos. 1–2, January–February 1967, p. 74.

Statistics concerning middle-level personnel in Uganda

In a study dealing with manpower problems in Uganda,[1] three categories of 'high-level manpower' are distinguished. Category B can be assimilated to middle-level personnel; it includes technicians, nurses and supervisors. Table 2 can be established on the basis of the data provided in this study.

TABLE 2. Middle-level manpower supply in Uganda, 1959

	Total	Africans
Technicians	1,391	814
Supervisors	413	262
Nurses	584	363

The total labour force in category A (professional manpower) stood at 1,660; category C comprised 3,800 skilled workers and 10,910 teachers (primary level). In 1959, then, middle-level personnel represented 12·7 per cent of the total 'high-level manpower' supply (categories A + B + C), that is, 0·63 per thousand of the entire adult population (3,780,000 persons of age 15 or over). In terms of the ratio of middle-level workers to the total adult population, the position was as follows: one technician to 2,717 adults, one supervisor to 9,152 adults and one nurse to 6,473 adults.[2]

In Uganda's second Five-Year Plan, manpower requirements are expressed by reference to different categories.[3] These categories are defined by the educational level required in each case; the figures in Table 3 are not, therefore, directly comparable with the previous ones.

TABLE 3. Existing high-level manpower supply and future requirements, Uganda, 1966-81: existing supply and forecasts

Level	1966 [1]	1972 [2]	1977 [2]	1981 [2]
First level	3,560	5,130	6,830	9,000
Second level	8,600	15,410	24,200	37,250
Third level [3]	5,230	8,150	12,890	19,900

1. Real figures.
2. Forecasts.
3. Cambridge School Certificate.

Source: Work for Progress, Uganda's Second Five-year Plan, 1966–1971, Entebbe, 1966, p. 134(2).

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[1] Robert L. Thomas, 'High-level Manpower in the Economic Development of Uganda', in: Harbinson and Myers, *Manpower and Education* ..., op. cit., p. 297–324.

[2] ibid., p. 303–11.

[3] *Labour Problems in the Economic and Social Development of Uganda*, cf. Table 13a, Geneva, International Institute for Labour Studies, 1967, 29 p., annexes (mimeo.) (Working Paper No. 1 of the East African Seminar on Labour Problems in Economic Development, Nairobi, 1967) (EAS/67/WP/1).

Partially developed countries

The two countries selected at this development level are Iran and Peru.

Statistics relating to middle-level personnel in Iran

The Plan Organization, which is the national development agency in Iran, has included forty-six occupations in its definition of 'high-level manpower'. All these occupations belong to ISCO major group 0/1 'Professional, Technical and Related Workers'—which, if we take into account all the criteria considered in Chapter 1 above, must surely be considered a rather narrow definition.

In 1958, the non-agricultural manpower supply in Iran amounted to 1,370,600 persons; 'high-level manpower' stood at 75,000 persons. This latter group thus represented 5·5 per cent of the non-agricultural labour force, 1·25 per cent of the total labour force and 0·4 per cent of the total population.[1]

Middle-level personnel could be estimated to account for 70 per cent of this group of 75,000 highly skilled workers, the breakdown being based on the educational level normally required for the different occupations. For 30 per cent of these a university training is the standard requirement, while for the remaining 70 per cent secondary education with or without supplementary specialized training is usually considered adequate. Of the 52,500 middle-level workers, the vast majority (40,862) were teachers, chiefly at the primary school level. The remainder (approximately 12,000 persons) comprised various categories of technicians and middle-level medical assistants. To these figures must be added, in accordance with our definition, the 8,820 supervisors and the 14,400 'leadmen' (foremen).

This imbalance between middle- and high-level personnel is exemplified by the ratio of certificated nurses to doctors, which stands at one to seven.

According to another, more recent source, the paucity of trained personnel in industry is primarily one of supervisors, foremen and other middle-level personnel, particularly managers. The Plan Organization estimates Iran's requirements in managers up to 1973 at a minimum figure of 12,000.[2]

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[1] George B. Baldwin, 'Iran's Experience with Manpower Planning: Concepts, Techniques and Lessons, in: Harbison and Myers, *Manpower and Education . . .*, op. cit., p. 140–72.

[2] Hoher Bedarf an Auslandskapital und an Führungskräften in Iran. Ehrgeizige Industrialisierungspläne' (Great Demand for Foreign Capital and Management Personnel in Iran. Ambitious Industrialization Plans), *Neue Zürcher Zeitung* (Zürich), No. 516. 24 August 1969.

Statistics relating to middle-level personnel in Peru

In 1961, the active population of Peru totalled some 3,120,800 persons, of whom 24,320—that is, 0·78 per cent—were middle-level workers.

Table 4 allows us to identify middle-level personnel within the active population as a whole.

Table 5 gives the breakdown of middle-level personnel by economic sector.

Table 6 indicates the educational level of middle-level personnel.

TABLE 4. Breakdown of the active population by occupational category in Peru in 1961

Occupational category	Total	Percentage
High-level scientific and technical personnel	15,540	0·50
Other high-level personnel	72,250	2·32
Middle-level personnel	24,320	0·78
Administrative, executive and managerial workers	836,910	26·82
Clerical workers	116,390	3·73
Sales workers	231,510	7·42
Skilled workers	91,450	2·93
Semi-skilled workers	404,910	12·97
Family agricultural workers	257,920	8·26
Unskilled workers	940,980	30·16
Unspecified	102,500	3·28
Armed Forces	24,300	0·78
Clergy	1,830	0·06
TOTAL	3,120,810	100·00

Source: OECD, *Problems of Human Resources Planning in Latin America and in the Mediterranean Regional Project Countries*, cf. p. 267–8, Paris, 1967, 279 p.

TABLE 5. Breakdown of middle-level personnel by economic sector, Peru, 1961

Economic sector	Middle-level personnel	
	Total	Percentage of total manpower in sector
Agriculture	550	0·04
Fishing	190	0·90
Extractive industries	860	1·29
Manufacturing industries	2,500	0·61
Food manufacturing	180	0·34
Manufacturing of textiles	90	0·05
Chemical industries	950	6·60
Metallurgical industries	90	0·15
Miscellaneous manufacturing	1,190	1·22
Construction	540	0·52
Electricity, gas and water services	60	0·64
Transport	1,180	1·26
Commerce	470	0·18
Banking, insurance	60	0·32
Government sector	2.460	2·12
Education	670	1·02
Personal services	14,310	4·85
Unspecified	490	0·40
TOTAL	24,320	0·78

Source: OECD, *Problems of Human Resources Planning in Latin America and in the Mediterranean Regional Project Countries*, Paris 1967, p. 267–8.

TABLE 6. Breakdown of middle-level personnel by educational level, Peru

Education level	Percentage of middle-level personnel having reached a given educational level
No formal education	1·2
Primary education	34·6
General secondary education	37·2
Technical secondary education	3·6
Higher education	
Teacher training	
Humanities	4·8
Medicine	1·2
Science and technology	2·4
Other education	12·6
Unspecified	2·4
TOTAL	100·0

Source: OECD, *Problems of Human Resources Planning in Latin America and in the Mediterranean Regional Project Countries*, Paris, 1967, p. 269.

With regard to the imbalance between middle- and high-level personnel, this may be exemplified by the ratio of certificated nurses to doctors, which is approximately one to two.[1]

Fragmentary statistical data relating to middle-level personnel in partially developed countries.

A Tunisian article brings out clearly how the transformation of agricultural structures will affect middle-level agricultural manpower requirements. These workers will, in fact, be called upon to play an important role:

> Before independence, colonial farms and the so-called pilot farms (managed by government executive officials) constituted primarily a cereal monoculture for which large numbers of high-level personnel, but very few middle-level personnel and skilled workers, were required.
>
> Tunisia's new agricultural development policy . . . is based on the following principles: (1) maximum utilization of modern farming techniques (which involves not parcelling out the large former colonial farms, so as to keep farms of a suitable size); (2) encouraging the small, traditional farms, also to move in the direction of mechanization particularly by recourse to the co-operative system.
>
> The role played by high-level personnel thus remains a vital one, while that of middle-level personnel and skilled workers becomes decisive (particularly for the success of co-operative schemes and for technical and social development in rural areas).[2]

In the Four-year Plan for 1965–68, requirements in skilled agricultural workers were estimated at 65,000 (that is, almost ten times greater than middle-level manpower requirements).

Table 7 shows how the number of training establishments for middle-level agricultural workers has increased since independence.

Colombia provides a striking example of the imbalance which is frequently to be noted between enrolment rates at the university level and at the level of secondary school terminal classes; in 1962, there were 1,150 students attending subprofessional higher schools (upper secondary schools training middle-level workers), as compared with 23,000 students in the universities.[3] This disparity brings out clearly three essential points: the need to upgrade the status of middle-level

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[1] William Foote Whyte (with the collaboration of Graciela Flores), 'High-level Manpower for Peru', in: Harbison and Myers, *Manpower and Education . . .*, op. cit., p. 45.

[2] A. Zghal, 'Cadres et Ouvriers Qualifiés dans le Nouveau Système Agricole', *Revue Tunisienne de Sciences Sociales* (Tunis), Vol. 3, No. 7, November 1966, p. 137–52.

[3] Harbison and Myers, *Education, Manpower and Economic Growth*, op. cit., p. 86.

TABLE 7. Number of middle-level agricultural training institutions and trainees, Tunisia, 1956/57–1964/65

Type of education	1956/57		1964/65	
	Number of establishments	Number of students	Number of establishments	Number of students
Secondary schools of agriculture	1	24	3	334
Intermediate schools of agriculture	3	224	15	1,953

Source: A. Zghal, 'Cadres et Ouvriers Qualifiés dans le Nouveau Système Agricole', *Revue Tunisienne de Sciences Sociales*, Vol. 3, No. 7, November 1966.

personnel; the need to restructure the educational system; the vital role that could be played by the training of adult middle-level personnel.

One of the rare exceptions as far as concerns this imbalance between university education and terminal secondary education in the partially developed countries would appear to be that of the People's Republic of China. In this country, professional faculties at the university level have been greatly expanded, though less rapidly than the sub-professional institutions, which provide training in a very wide variety of specialized fields.[1]

Semi-advanced countries

The two countries selected at this development level are Yugoslavia and Italy.

Statistics relating to middle-level personnel in Yugoslavia

Yugoslavia is one of the six countries taking part in the OECD Mediterranean Regional Project. The four categories of 'qualified personnel' distinguished in the national report relating to this project [2] are defined by educational level. Table 8 gives the breakdown of 'qualified personnel' in the socialized sector in 1960 and in 1975 (estimates).

In this context, middle-level personnel can be assimilated to categories 2 and 3 (professional personnel with secondary qualifications and highly skilled workers).

Thus, in 1960, middle-level personnel represented 19·5 per cent of the total labour force in the socialized sector; according to the final estimates, they should represent 28·9 per cent thereof by 1975.

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[1] Harbison and Myers, *Education, Manpower and Economic Growth*, op. cit., p. 88.

[2] OECD, *Country Reports. The Mediterranean Regional Project: Yugoslavia*, Paris, 1965, 143 p.

TABLE 8. Final estimate (total) of the qualification structure in the socialized sector, Yugoslavia

Category	Absolute figures (in thousands)		Percentage	
	1960	1975	1960	1975
Professional personnel with higher qualifications	185·1	453·0	6·4	8·2
Professional personnel with secondary qualifications	366·6	1,029·5	12·7	18·7
Highly-skilled workers	195·6	562·0	6·8	10·2
Skilled workers	742·9	1,700·0	25·7	31·0
Total qualified personnel	1,490·2	3,744·5	51·6	68·1
Semi-skilled and unskilled personnel	1,400·3	1,750·9	48·4	31·9
TOTAL	2,890·5	5,495·4	100·0	100·0

Source: OECD, *Country Reports. The Mediterranean Regional Project: Yugoslavia*, Paris, 1965, p. 87.

Closer examination of category 1 (professional personnel with higher qualifications) reveals a subcategory which might be termed 'senior middle-level personnel'. These people have completed two years of post-secondary schooling. Table 9 gives a detailed breakdown.

TABLE 9. Personnel with higher qualifications in Yugoslavia. Situation in 1960, estimates for 1975 (in thousands)

Category		1960		1975
University graduates		107·7		273
Two-year post-secondary school graduates		48·0		171
Of which:				
Engineers, etc.	2·0		30	
Agricultural technicians, etc.	0·1		10	
Economists, etc.	20·0		40	
Medical workers	2·0		6	
Teaching personnel	19·3		75	

Source: OECD, *Country Reports. The Mediterranean Regional Project: Yugoslavia*, Paris, 1965, p. 98.

This table takes account only of those who acquired their qualifications through regular schooling or schooling in the course of work. In 1975, there will be 9,000 persons in this category who acquired their qualifications in other ways.

Table 10, detailing as it does the ways by which these people acquired their qualifications, is of particular relevance to the training of adult middle-level personnel. In addition to category 2 (professional personnel with secondary qualifications), data will be given concerning category 1 (professional personnel with higher qualifications) and categories 3 and 4 together (highly skilled workers and skilled workers), although only a minority of these two categories can be ranked as middle-level personnel.

TABLE 10. Required outputs, classified according to mode of acquisition of skills or qualifications: Yugoslavia, 1961–75 (in thousands)

Qualification category	Regular education	Part-time education	Taking examinations on the job	By virtue of seniority	Unspecified
1. Professional personnel with higher qualifications	337·0	132·0	—	—	—
TOTAL	469.0				
2. Professional personnel with secondary qualifications	635·0	60·0	—	—	—
TOTAL	695·0				
3. Highly skilled and skilled workers	873·4	100·0	770·6	—	—
TOTAL	1,744·0				

Source: OECD, *Country Reports. The Mediterranean Regional Project: Yugoslavia*, Paris, 1965, p. 95, 96, Tables 81, 83, 84.

It emerges from this table that promotion by virtue of seniority is doomed to disappear (in 1960, the labour force included a sizeable percentage of workers who had acquired their qualifications or skills 'by virtue of seniority': 18,900 persons in category 1, 28,000 persons in category 2 and 110,300 persons in categories 3 and 4); that the largest proportion of manpower will, as is only natural, receive their training through the regular educational process; and that part-time education will also play a very important role.

Statistics relating to middle-level personnel are also to be found in a report on *The Function and Growth of Personnel in Yugoslavia's Industrial Development* presented at a symposium organized by UNIDO.[1]

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[1] J. Brebič, *The Function and Growth of Personnel in Yugoslavia's Industrial Development*, New York, UNIDO, 1967 (UNIDO-ID/CONF.1/G24) (report presented at the International Symposium on Industrial Development, Athens, 1967).

TUTE OF EDUCATIO

Statistics relating to middle-level personnel in Italy

Italy constitutes a most interesting example for the purpose of our study, and this for two reasons. Firstly, 'intermediary' personnel, defined according to the functions they exercise, constitute an official category in manpower statistics; secondly, special importance is attached in this country to so-called out-of-school training activities (*formazione extrascolastica*).

Intermediary workers are broken down, on the one hand, by function, into technicians, supervisory grades and foremen and, on the other hand, by degree of responsibility, independence and authority, into junior and senior intermediary personnel.

The relative and absolute figures for intermediary personnel in 1951, 1961 and 1975 are shown in Table 11.

It is apparent from this table that the middle-level labour force is constantly on the increase. In 1951, such workers made up 8·8 per cent of the total manpower stock, in 1961 they accounted for 12·1 per cent and in 1975 they are estimated to reach 26·5 per cent.

Italy has had a major out-of-school training system ever since the immediate post-war years, when it was set up to cope with the large numbers of unemployed. Since educational establishments at the various levels lack the capacity to meet manpower requirements on their own, out-of-school training will continue to play a major role. This role will, however, be changed:

> Supplementary training should be the means of enabling not only young people to enter the labour market but also workers to continue to improve their qualifications. . . . Finally, supplementary training should be permanently responsible for encouraging the desire for social betterment. In more industrially advanced countries than Italy, this helps meet a dual need, by supplying firms with intermediary and higher grades of personnel, and by enabling the individual to rise in occupational and social status.[1]

It should, however, be noted that the appropriate instruments for training adults for middle-level occupations do not as yet exist.

It would appear, in fact, that the problem of providing out-of-school training facilities for middle-level adult personnel calls for a radically new approach:

> It is clear that, although there is a shortage of 1.7 million middle-level workers (based on an estimate of qualified manpower requirements and on the number of diploma-holders during 1962–75), there is a corresponding number poten-

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[1] OECD, *Country Reports. The Mediterranean Regional Project: Italy*, Paris, 1965, p. 80.

Table 11. Occupational breakdown of employment by economic sector: Italy, 1951, 1961 and 1975 (in percentages)

	1951				1961				1975			
Occupational category	Total	Agri-culture	Indus-try	Serv-ices	Total	Agri-culture	Indus-try	Serv-ices	Total	Agri-culture	Indus-try	Serv-ices
Top management and other senior executives	2·4	0·2	1·4	6·6	3·2	0·3	1·6	7·9	6·6	0·5	4·6	11·7
Technicians	2·2	0·3	1·4	5·9	5·2	0·4	3·5	11·4	11·4	1·5	11·5	16·0
Supervisory grades	5·8	—	4·2	16·1	5·9	—	4·1	13·5	11·6	—	7·6	21·4
Foremen	0·8	—	1·9	0·6	1·0	—	2·0	0·8	3·5	—	4·5	4·1
Skilled personnel	22·1	3·0	49·2	18·1	28·9	6·7	52·7	21·7	51·6	75·0	59·9	31·6
Unskilled workers	66·7	96·5	41·9	52·7	55·8	92·6	36·1	44·7	15·3	23·0	11·9	15·2
TOTAL	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0

Source: OECD, *Country Reports. The Mediterranean Regional Project: Italy*, see p. 33, 34, 69, Paris, 1965, 233 p.

tially available in the category below. These, if suitably trained, could perform higher-level jobs; incidentally, there is an ever-growing number of people doing jobs for which they have not been properly trained.

In both cases, those concerned are already employed and absorbed into their jobs; it is hard to induce them to better their occupational qualifications. This is particularly true of most of the small and medium-sized firms.

To give some idea of the extent of what has to be done, it should be noted that, by resorting to evening classes and correspondence courses, 100,000 workers could be reclassified at a rate of 5,000 to 10,000 per year by 1975, if action were taken; this would mean a total of about 700,000 during the period under consideration. Half of these could be encouraged to join evening classes arranged by vocational and technical institutes. The rest could be trained through correspondence courses, which at the moment are badly organized, and which will absorb a sizeable number of teachers.[1]

The objectives of supplementary training schemes for 1962–75 are summarized in Table 12 (in which, for purposes of comparison, occupational categories situated above and below middle-level personnel, have also been included).

TABLE 12. Objectives of supplementary training activities in Italy for the period 1962–75

Occupational category	Personnel trained per year			Total,
	1962	1965	1975	1962-75
Top management and other senior executives	—	1,000	20,000	100,000
Senior intermediary personnel	—	5,000	40,000	250,000
Junior intermediary personnel	—	5,000	60,000	450,000
Skilled workers	100,000	250,000	250,000	3,000,000

Source: OECD, *Country Reports. The Mediterranean Regional Project: Italy*, Paris, 1965, p. 103.

This table highlights the cardinal role that the training of adult middle-level personnel is called upon to play in Italy.

Statistics concerning middle-level personnel in Italy are also to be found in a publication closely connected with the Mediterranean Regional Project,[2] in a chapter of a work dealing with the training of intermediary technicians [3] and in an article on the enterprise considered as a training ground.[1] According to the estimates given in this article, 41 per cent of top management and senior executives, 22·9 per cent of middle-level personnel and 47·6 per cent of technicians, junior professional personnel, skilled and semi-skilled workers trained during 1951–61 received their training on the job.

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[1] OECD, *Country Reports. The Mediterranean Regional Project: Italy*, Paris, 1965, p. 100–1.

[2] Centro Europeo dell'Educazione, *Le Strutture Formative al 1975* (Training Structures in 1975), by Nino Novacco and Gino Martinoli, Rome, Fratelli Palombi Editori, 1966, 406 p.

[3] M. Vita, 'La Formazione dei Tecnici Intermedi' (Training of Intermediary Technicians), in: *La Formazione del Personale nelle Aziende Industriali; Saggi Raccolti a Cura dell'IRI*, op. cit.

Fragmentary statistical data relating to middle-level personnel in the semi-advanced countries

A Hungarian article on problems relating to the supply of agricultural technicians and their training contains statistical data concerning the manpower stock and future requirements as regards agricultural engineers and technicians:

> In 1962, 38,000 agricultural specialists (engineers and technicians) were employed in State collective farms, government departments, machine tractor stations and training and research institutes; 29.3 per cent of these specialists had a university degree (engineering). . . . The shortage of agricultural technicians and engineers is particularly acute in farms situated in remote country districts. To set this situation to rights, recourse may be had, firstly, to the upgrading of workers already employed in agriculture, of whom 18.9 per cent are enrolled in continuation correspondence courses and, secondly, to the 700 to 800 engineers and the 1,100 to 1,200 technicians who each year complete their training.

A study prepared jointly by the National Planning Office and the Ministry of Agriculture forecasts that, by 1980, there will be a need for 17,000 agricultural engineers and 25,000 agricultural technicians (these estimates will be reviewed subsequently). It will also be necessary to provide for a better distribution of tasks among middle-level and senior technicians, engineers and specialized engineers.[2]

In Spain,

> the Development Plan forecasts that national requirements in 1970 will stand at 26,000 senior technicians and 53,400 middle-grade technicians. Requirements with regard to junior technical personnel have not been estimated, but these might without exaggeration be set at approximately 100,000 workers.[3]

In the semi-advanced countries, in general, the ratio of professionals to technicians indicates an under-utilization of professionals. Subprofessional education has lagged relative to professional education with the result that there are too many university-trained engineers, scientists, doctors and agronomists relative to the technicians available.[1]

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[1] Giuseppe De Rita, 'L'Azienda come Sede di Formazione, Realità Odierna e Possibilità Future' (The Enterprise as a Training Ground, Present-day Reality and Future Prospects), *Formazione e Lavoro* (Rome), No. 22, November-December 1966, p. 30-2.

[2] György Fekete, 'A Mezögazdasàgi Szakember Ellátottsag és képzés Problémài' (Number of Agricultural Technicians and their Training), *Közgazdasàgi Szemle* (Budapest), Vol. 10, No. 6, June 1963, p. 622–77.

[3] Pablo A. Vidal Rius and Guzman d'Hotellerie, 'Formación de Personal Técnico' (Training of Technical Personnel), *Revista CEAM* (Barcelona), No. 71–72, 1965, p. 29–34.

Advanced countries

Statistics relating to a single country, France, will serve to illustrate this development level; fragmentary statistical data will, however, be given in regard to several others.

Statistics relating to middle-level personnel in France

In official French usage, the term 'middle-level personnel' (*cadres moyens*) is applied solely to administrators and government officials occupying positions between 'executive and managerial' and 'clerical' workers. This understanding of the term is too narrow for the purposes of the present study. In establishing Table 13, we have, accordingly, chosen those occupations which can be classed under middle-level personnel, as defined in the second part of Chapter 1. The table will not, however, be complete, since certain occupations which ought to be taken into account are lumped in with other groups.

TABLE 13. Numbers employed in certain occupations which can be classed under middle-level personnel, France, 1954, 1962, and forecasts for 1978

Occupation	Numbers employed					
	In thousands			As percentage of total employment		
	1954	1962	1978	1954	1962	1978
054 Technicians and technical agents	247	343	760	1·32	1·79	3·53
055 Draughtsmen	84	117	262	0·44	0·62	1·22
061 'Middle-level personnel' [1]	204	272	493	1·07	1·44	2·29
092 Midwives, certificated and specialized nurses	80	94	229	0·42	0·50	1·07
096 Social workers	19	20	35	0·10	0·10	0·17
101 Primary school teachers and assistant teachers	267	373	520	1·41	1·97	2·41
102 Secondary school teachers, school administrators, educational psychotherapists	55	81	168	0·29	0·43	0·78
Total number employed	18,944	18,956	21,500	100	100	100

1. Administrators and government officials.

Source: France, Commissariat Général du Plan d'Équipement et de la Productivité. 'Rapport Général de la Commission de la Main-d'œuvre', *Revue Française du Travail* (Paris), Vol. 20, No. 1, January-March 1966, p. 32-3.

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[1] Harbison and Myers, *Education, Manpower and Economic Growth*, op. cit., p. 122.

The competent French departments have established a nomenclature of educational levels for use in forecasting training requirements. Six levels are distinguished, defined as follows:[1]

Levels I and II: Personnel in positions normally requiring educational qualifications above or equivalent to a university degree (eleven to thirteen years of schooling on average after the start of lower secondary education).

Level III: Senior technicians and professional personnel in positions for which the normal requirement is an educational qualification equivalent to two years of schooling beyond the *baccalauréat* or the technical certificate (*brevet de technicien*) (nine years of schooling on average after the start of lower secondary education).

Level IV: Personnel in supervisory positions or possessing a qualification equivalent to the industrial or commercial certificate (*brevet d'enseignement industriel, commercial*) or the technical certificate (seven years of schooling on average after the start of lower secondary education).

Level V: Personnel in positions normally requiring an educational qualification equivalent to the *certificat d'aptitude professionnelle* (vocational proficiency certificate) or the *brevet d'études du premier cycle* (lower secondary school certificate).

Level VI: Personnel in positions for which no further training beyond compulsory schooling is required.

Levels III and IV can be considered as corresponding to 'senior' and 'junior' middle-level personnel defined according to educational level.

The relative numbers of personnel to be recruited at each educational level can be seen from Table 14.

TABLE 14. Percentage breakdown of recruitment requirements, in France, by educational level

Level	1962–70	1978	Level	1962–70	1978
Levels I and II	10	10	Level V	45	43
Level III	10	11	Level VI	23	23
Level IV	12	13	TOTAL	100	100

Source: France, Commissariat Général du Plan d'Équipement et de la Productivité, 'Rapport Général de la Commission de la Main-d'œuvre', *Revue Française du Travail* (Paris), Vol. 20, No. 1, January–March 1966, p. 34.

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[1] France, Commissariat Général du Plan d'Équipement et de la Productivité, op. cit., p. 155.

With regard to a special category of middle-level personnel—technicians, draughtsmen and supervisors in the metallurgical industries—detailed statistics concerning the situation prevailing in 1964 and forecasts of future requirements are to be found in a study published by the Metallurgical and Mining Industries Association.[1] These statistics also give a breakdown of middle-level technical workers by occupational function and by educational level.

Fragmentary statistical data relating to middle-level personnel in the advanced countries

In an article dealing with the training of supervisors in the Federal Republic of Germany, the demand for industrial supervisors (replacements, supplementary recruitment) is estimated at a minimum of 7,000 qualified personnel annually.

The courses organized by the Chambers of Industry and Commerce and the special industrial courses are capable of turning out no more than some 3,000 such personnel annually. The remainder are promoted from the rank and file and receive no supplementary training.[2]

In the U.S.S.R., recruitment requirements in 1970 for qualified personnel in forest management and forest industries were estimated at 10,000 to 11,000 sylviculturists and 27,000 to 28,000 sylvicultural technicians. A comparison of these figures with the number of students who, according to forecasts, would complete their training in higher and middle-level forestry schools during 1966–70 revealed a substantial deficit: 3,000 to 4,000 sylviculturists and 10,000 to 12,000 technicians. Table 15 reveals the existence of an imbalance between the number of sylviculturists and the number of technicians in this sector.

Generally speaking, the allocation and utilization of high-level manpower are better in advanced countries than in others, but there is still room for improvement in both processes. For example, the ratio of professionals to subprofessionals or technicians is still far from optimal. A 1957–58 survey of ninety United States companies revealed that the overall ratio of technicians to engineers was about 0·8 to 1, whereas the optimum ratio was regarded as 5 or more to 1. Similarly, the ratio of 1 to 2

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[1] Union des Industries Métallurgiques et Minières, *Les Agents Techniques, Techniciens, Dessinateurs et Agents de Maîtrise des Industries des Métaux, Situation en 1964—Prévisions des Besoins*, Paris, n.d., 149 p.

[2] Hoffman, 'Zum gegenwärtigen Stand der Industriemeisterausbildung in Westdeutschland' (Present-day Situation with Regard to the Training of Industrial Supervisors in Western Germany), *Wirtschaft und Berufserziehung* (Bielefeld), Vol. 14, No. 2, February 1962, p. 27–32.

TABLE 15. Ratio of sylviculturists to sylvicultural technicians in the U.S.S.R.

Subsector	Actual data (graduating during 1959–65)	Estimates based on number of students (graduating 1966–67)	Standard ratio (in terms of needs)
Forest management	1·1	1·8	3·5
Floating and related operations	2·8	2·0	3·2
Mechanical processing of wood	2·7	3·1	3·4
Chemical processing of wood	1·5	1·6	2·9

Source: B. D. Ionov and T. B. Ionova, 'Nerešennye Voprosy Lesotechničeskogo Obrazovanija' (Unsolved Problems of Technical Forestry Introduction), *Lesnaja Promyšlennost'* (Moscow), Vol. 46, No. 6, June 1966, p. 5–6.

or 1 to 3 which is officially regarded as the optimum ratio for the engineering and industrial sector in the U.S.S.R. has never yet been met.[1]

Conclusions

The statistics presented in this chapter are intended to illustrate and to clarify the situation in countries that have reached different development levels. They substantiate the observations put forward in Chapter 2. Nevertheless, the occupational categories identified as middle level vary from country to country. It would, therefore, be improper to venture further and to draw, for example, international comparisons on the basis of these statistics.

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[1] Harbison and Myers, *Education, Manpower and Economic Growth*, op. cit., p. 164.

Chapter 4

Laws and regulations governing middle-level personnel

There can be no question, in this chapter, of drawing up a systematic and comprehensive register of laws and regulations governing middle-level personnel. To do so, an inquiry would first have to be addressed to the governments of every country. It would further be necessary to define beforehand the expression 'middle-level personnel'. An additional —though not, admittedly, insurmountable—difficulty would be entailed by the fact that the laws and regulations involved may be initiated by quite different ministries: ministries of labour, of education, social affairs, planning, industry, agriculture and so forth.

This chapter will, accordingly, be made up of a series of examples. Its structural basis is an *ad hoc* classification of the various types of laws, decrees, orders, regulations, etc., which include provisions governing middle-level personnel. It is, broadly speaking, possible to distinguish: laws governing the entire, or almost the entire field of training (and occasionally of education); economic and social development plans containing provisions relating to middle-level personnel; statutes regulating the training and status of certain categories of middle-level personnel; statutes regulating points of detail in connexion with the training and further training of middle-level personnel; and, lastly, legislation governing specific economic sectors which contains provisions relating to middle-level personnel.

Three examples—a law of the German Democratic Republic, a Swiss law and a French law—will serve to illustrate the case of provisions relating to middle-level personnel which are incorporated in laws governing the whole, or virtually the whole, field of training (and where the German Democratic Republic is concerned, that of education also).

The Law on the Unified Socialist Educational System of the German Democratic Republic is founded on the principle that:

> All levels of education and vocational training should be woven into a unified system whose goal would be to offer uninterrupted education and training, closely adapted to the needs of real life and aimed at preparing the individual for his particular work.

Pre-school institutions, the ten-year basic school, vocational training institutions, further training facilities and upgrading training for workers, streams preparing for the secondary-school certificate, schools for higher technicians, technical schools and university-level institutions are all included in the unified system provided for in the law.

This system is conceived to permit progressive education, access to the highest levels being reserved for the most talented. By linking instruction and production the aptitudes and interests of the individual are brought in line with the requirements of economy.

The elements of this system which have a special bearing on the training of adult middle-level personnel are: training for promotion, and the schools for technicians and higher technicians.

Training with a view to promotion to supervisory posts includes courses in technology and plant management, production organization and applied pedagogics. It should bear in mind the need to increase production and productivity, improve the quality of the finished product and reduce general expenses.

Further training and upgrading courses are given in plant schools *(Betriebsakademie)* in co-operation with other training and educational institutions and the workers' universities. Arrangements should be made so that girls and women can benefit from this type of training.

Schools for technicians and higher technicians (*Ingenieur- und Fachschulen*): various types of technician are trained in these institutions. Admission of trainees is left to the decision of headmasters, on the basis of candidates' previous career and work experience. At the end of their studies, trainees are required to sit for an official examination for the secondary school leaving certificate. (Those receiving very high marks are to be selected for further training at university institutions.)

Women workers preparing for final examinations in these institutions should benefit from all appropriate facilities. In particular they should have access to part-time courses or correspondence courses.

Training is given either full-time or by means of evening courses and correspondence courses. The scientific and practical training acquired in the schools for technicians and higher technicians must be kept up to date and supplemented by such means as part-time courses, further training courses and participation in the work of research institutes.[1]

In Switzerland, the Federal Law on Vocational Training (of 20 September 1963) governs training and further training in industry, skilled manual trades and crafts, business, banking, insurance, transport services, catering and lodging services and other service occupations and home economics.

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[1] German Democratic Republic, 'Gesetz über das Einheitliche Sozialistische Bildungssystem' (Law on the Unified Socialist Educational System), *Gesetzblatt der Deutschen Demokratischen Republik* (Berlin), Vol. 1, No. 6, 25 February 1965, p. 83–106.

Further vocational training is given an important place in this law. It comprises courses intended for semi-skilled workers, specialized training courses, retraining and upgrading courses, as well as courses preparing students for the higher technical schools and for other higher institutions. Federal allocations for the implementation of these further training schemes have been increased.

With regard to final trade examinations and examinations for supervisory grades, these have been split into two, comprising a general trade examination (for foremen, works managers and other middle-level technical personnel) and an examination for supervisory grades for which candidates must possess high qualifications (general managers or salaried employees exercising functions for which special skills are required). The competent professional associations have the option of organizing either one or both of these examinations in each trade.

For the first time, the law defines the sphere of activities of the higher technical schools. Those holding diplomas conferred by these schools may use the title of *ingénieur technicien ETS* (École Technique Supérieure) or *architecte technicien ETS*.[1]

In France, the Act No. 66-892 of 3 December 1966 on the Orientation and Programme of Vocational Training declares such training—both basic and further—to be a 'national obligation'. The State, local communities, public and private educational establishments, professional and family associations and trade unions as well as commercial enterprises are required to co-operate in providing such training.

Vocational training and further education for social advancement will be governed by a co-ordinated policy worked out in close consultation with employers' and workers' organizations.

A vocational training and further education fund is to be set up under the direct responsibility of the Prime Minister. The system of agreements (conventions) for training and further education [2] will be expanded.

Workers taking State-approved training or further education courses will be entitled, on submitting a request to their employer, to special unpaid leave for the duration of the course (maximum: one year). A special degree will lay down the rules for determining, for each establishment and occupational category, the maximum number of workers to be authorized to take such leave during a given year.

Within one year from the date of promulgation of this Act, a list of public training and further education schemes is to be drawn up for each ministerial department.

In order to raise the standard of agricultural production, training and further education courses, as well as study sessions leading to advanced diplomas in agronomy and agricultural technology, will be organized for farmers and agricultural workers, in consultation with the professional bodies concerned. These courses will be held at centres for agricultural training and further education, which may be the object of a special agreement with the Ministry of Agriculture.

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[1] Switzerland, 'Loi Fédérale sur la Formation Professionnelle du 20 Septembre 1963', *Feuille Fédérale* (Berne), Vol. II, No. 40, October 1963, p. 753–77.

[2] A system under which the State makes a major contribution to training and further training schemes, over which, in return, it exercises a certain degree of control.

Centres for training and further education in the artisan trades may be set up on the initiative of the chambers of artisan trades in order to facilitate access to managerial positions in this sector or to provide training and further training for persons already holding such positions.[1]

The Togolese Economic and Social Development Plan 1966–1970 provides an example of the second type of legislative or statutory act defined above:

> The Plan proposes to determine and implement a vocational training policy which will remedy this situation. A national occupational training organization should be set up within the Central Planning Authority—the human resources section.

The provisions which follow bear more particularly upon the training of various grades of supervisory personnel in the industrial, agricultural and craft trades sectors; for this purpose technical education should be provided throughout secondary education (junior as well as senior).

Rural development is to be given high priority. By 1970 it is hoped to have trained 178 senior managerial staff for the agricultural sector and 622 supporting staff for regional development societies. In addition, periodical refresher and updating courses (including correspondence courses) will be organized for skilled agricultural workers and management staff. Selected farmers and rural leaders will be given special training at the centres and at model farms operated by the Department of Agriculture.

The Plan also provides for a further training scheme for craft trades.[2]

Examples taken from the German Democratic Republic, the Federal Republic of Germany, New Zealand and the U.S.S.R. will serve to illustrate the case of laws, statutes, regulations and other legislation specially devised to regulate the training or further training of certain categories of middle-level personnel.

The order dated 1 December 1966 concerning Advanced Studies in Branches of Engineering at University Technical Faculties and Technical

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[1] France, 'Loi No. 66-892 du 3 Décembre 1966 d'Orientation et de Programme sur la Formation Professionnelle', *Journal Officiel de la République Française*, Vol. 98, No. 279, p. 10.611–13.

[2] Togo, *Plan de Développement Économique et Social 1966–70*, Lomé, 1965, 261 p.

Institutes of the German Democratic Republic is intended to provide for the in-service training—both practical and theoretical—of senior technicians and graduate engineers.

The conditions of admission which candidates are required to satisfy with regard to practical skill and experience are determined by the responsible training establishments, in agreement with the competent State and economic authorities. Senior technicians may be required to sit a preliminary qualifying examination if the specialty they intend to follow calls for particularly high standards in mathematics and science.

As a general rule, training takes the form of correspondence courses or evening courses, lasting for two years. In exceptional cases, trainees may follow a full-time day course, of a minimum duration of six months. During their course, students are required to present a number of set papers on subjects related to their occupational field.

Graduate engineers and senior technicians who pass the final examinations to which these courses lead are awarded a diploma by the responsible establishment conferring upon them the occupational title corresponding to the specialty studied.[1]

In the Federal Republic of Germany, the training of middle-level and senior technicians has, since 1964, been governed by a set of basic regulations and an agreement between the Ministers of Education (*Kultusminister*) of the *Länder*.

The Basic Regulations for the Training of Technicians adopted by the Permanent Conference of Ministers of Education on 27 April 1964, lays down the objectives, means and organization of such training, as well as the conditions of admission. In order to qualify for such training, candidates are required to have:

Completed their primary schooling plus the statutory related training at a vocational school.

Completed apprenticeship in their trade, passing the examination for the *Facharbeiter* (skilled worker) or *Geselle* (journeyman) level.

Acquired practical experience in the specialization chosen (or in a related trade); candidates for full-time courses must have had at least two years such experience, while a minimum of one year is required of those wishing to enrol for courses at *Abendgymnasien* (evening schools).

Training for technicians lasts for three semesters in schools providing full-time courses and for a minimum of six semesters in the evening schools.

Training is divided into two phases: in the first phase, students acquire the basic knowledge and skills; in the second, they learn to apply the knowledge they have acquired. It is not considered desirable that specialization should be dictated by the needs of particular enterprises.[1]

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[1] German Democratic Republic, 'Anordnung über die Durchführung von postgradualen Studien zur Ausbildung von Fachingenieuren an den Technischen Hochschulen und Ingenieurschulen der Deutschen Demokratischen Republik vom 1. Dezember 1966', (Order Dated 1 December 1966 Concerning Advanced Studies in Branches of Engineering at University Technical Faculties and Technical Institutes of the German Democratic Republic), *Gesetzblatt der Deutschen Demokratischen Republik* (Berlin), Vol. II, No. 138, 7 December 1966, p. 873-4.

The Permanent Conference of Ministers of Education also drew up in 1964 an Agreement Standardizing the Technical Colleges. This lays down the requirements which educational establishments must meet in order to qualify as technical colleges (*Ingenieurschulen*).

The following are the conditions of admission to these schools: lower secondary school-leaving certificate or its equivalent or a certificate for admission to the technical stream of a technical school (*Fachschulreife, Fachrichtung Technik*); alternatively, students must have completed a two-year practice period in the specialty in question, or have completed an apprenticeship, confirmed by a trade certificate (*Gesellen- oder Facharbeiterprüfung*), in the branch concerned. Special arrangements can be made for candidates holding a senior secondary school-leaving certificate.

Courses of study last for six semesters. A mid-course examination is held at the end of the third semester; the final examination is recognized by the State. Students who have a natural aptitude for scientific work must be enabled to go on to university and the State is, accordingly, under an obligation to provide needy students with financial assistance throughout their course of studies.[2]

The Technicians Training Act 1967 of New Zealand regulates the training of technicians and the conditions of their employment. The Ministry of Labour is responsible for administering the Act.

The Act empowers the government to set up Technician Training Councils (TTC). Before an order is issued to this effect, the following conditions must be satisfied:

The employer organization(s) whose members are engaged in the industry shall agree (after consultation of any interested union or institute of technicians) to the proposed training scheme.

The proposed scheme is also to be approved by the Minister.

Every employer organization and every union connected with the industry shall agree on basic provisions fixing the conditions of employment of trainees employed in the industry.

The Secretary of Labour must facilitate the conclusion of such agreement, services, etc.

The TTCs are responsible for administering all training schemes within their jurisdiction, and may take steps to amend or codify the basic provisions fixing the conditions of employment of any class of trainee in the industry concerned. They are also empowered to cancel any contract between an employer and a trainee.

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[1] Federal Republic of Germany, 'Rahmenordnung für die Ausbildung von Technikern' (Basic Regulations for the Training of Technicians), *Informationen über das Berufliche Bildungswesen* (Düsseldorf), Vol. 15, No. 6, June 1964, p. 5–6.

[2] Federal Republic of Germany, Kultusministerkonferenz, 'Vereinbarung zur Vereinheitlichung des Ingenieurschulwesens' (Agreement Standardizing the Technical Colleges), *Berufskundliche Mitteilungen* (Nuremberg), No. 2, February 1964, p. 33–5.

To raise money towards the expenses of and towards the cost of operating the training schemes under the administration of a TTC, the Order establishing the Council may provide for levies to be imposed on employers engaged in the industry and lay down the method of their assessment and collection.[1]

On 9 May 1963, the Central Committee of the Communist Party and the U.S.S.R. Council of Ministers jointly decided to introduce a series of measures designed to develop higher and specialized secondary education and to improve the training and employment of specialized staff [improved planning of specialized training, development of training facilities, updating of educational materials, rational utilization of specialized staff in the economy].

With regard to industry and agriculture, specialized training schemes must provide for the progressive and particularly intense development of technician training (middle-level specialized staff), so that by 1970 the ratio of these technicians to engineers may reach 3 (or 4) to 1.[2]

To the same effect, the Central Committee of the Party and the Council of Ministers adopted in 1966 the following measures designed to develop and to improve specialized secondary education for technicians and other middle-level specialized staff:

The ministries or departments responsible for the various educational establishments in a given sector, are to draw up lists of occupations in which specialized workers are to be trained and will decide upon the establishment of new institutions for specialized secondary education. The ministries or departments concerned must act in agreement with the U.S.S.R. Ministry for Specialized Secondary and Higher Education.

As it has been proved to be the most suitable method for training such staff, both pedagogically and economically, preference shall be given to full-time study in the further expansion of this level of training. The full-time training institutions are to give priority in their admissions to persons who have already been engaged in occupations corresponding to the branch of specialized training to be undertaken.

To improve the practical training of specialized workers and also the arrangements for their production training periods, the undertakings organizing the latter shall be permanently attached to the corresponding training institutions.[1]

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[1] New Zealand, 'Technicians Training Act 1967', *Government Printer* (Wellington), No. 161, 24 November 1967, 19 p.

[2] U.S.S.R., O 'Merah po Dal'nejšemu Razvitiju Vysšego i Srednego Special'nogo Obrazovanija, Ulučšeniju Podogotovki i Ispol'zovanija Specialistov' (Measures Designed to Expand Higher and Specialized Secondary Education and to Improve the Training and Employment of Specialized Staff), *Bjulleten' Ministerstva Vyssego i Srednego Special'nogo Obrazovanija SSSR* (Moscow), No. 8, August 1963, p. 4–13.

Examples taken from Czechoslovakia, France, Poland, the U.S.S.R. and Luxembourg will serve to illustrate the case of legislation regulating points of detail in regard to the training and further training of middle-level personnel (or of several occupational categories, including middle-level personnel).

A decree of the Czechoslovak Ministry of Finance (Decree No. 8 of 30 January 1967) concerning study leave sets forth the benefits for trainees attending short residential further training courses. These courses shall be considered to be of short duration if they do not exceed three months uninterrupted training. An employee may participate in such courses provided that he is either sent by, or has received the agreement of, his employer. He shall receive leave to attend the course and his average wage during it, when participation is in the interests of both parties. Where it is solely in the interests of the employee, he shall be entitled to leave only.[2]

In France, a similar law (No. 68-1249 of 31 December 1968) regulates the remuneration of trainees enrolled in vocational training courses.[3]

In Poland, a resolution of the Council of Ministers dated 21 August 1959 stipulates that the title of supervisor is conferred on candidates who pass an examination held for the purpose. The title is conferred without examination upon workers who have successfully completed a course of studies at the supervisory school.[4]

In Luxembourg, government regulations of 24 March 1962 lay down the programme and procedure for master-craftsman examinations:

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1. U.S.S.R., 'O Merah po Ulučšeniju Bodgotovki Specialištov i Soveršenstvovaniju Rukovodstva Vysšim i Srednim Special'nym Obrazovaniem v Strane (Prikaz Ministra Vysšego i Srednego Special'nogo Obrazovanija SSSR, No. 360 ot 16.9.66)' (Measures to Improve the Training of Specialized Staff and the Administration of Specialized Secondary and Higher Education (Order No. 360, dated 16 September 1966, of the Minister of Specialized Secondary and Higher Education), *Bjulleten' Ministerstva Vysšego i Srednego Special'nogo Obrazovanija SSSR* (Moscow), No. 12, December 1966, p. 1–6.
2. Czechoslovakia, 'Vyhlàska Ministerstva Financic. 8 ze dne 30 Ledna 1967 o Poskytování Pracovního Volna a o Hospodárském Zabezpecení Pracovníku pri Úcasti na Odborném Skolení Organizovaném Formou Kratkodobého Internátního Soustredeni (Decree No. 8 of the Ministry of Finance, Dated 30 January 1967, Concerning Study Leave and Allowances and Other Benefits for Trainees Attending Short Residential Further Training Courses), *Sbírka Zákonu Ceskoslovenské Socialistické Republiky* (Prague), No. 4, 24 February 1967, Text No. 8, p. 29–31.
3. France, 'Loi No. 68-1249 du 31 Décembre 1968 Relative à la Rémunération des Stagiaires de la Formation Professionnelle', *Journal Officiel de la République Française (Lois et Décrets)* (Paris), Vol. 101, No. 2, January 1969, p. 74–6.
4. Maria Lubracka, 'Tytuly Kwalificacyjne Robotnikow i Majstrow' (Certificates and Diplomas for Workers and Supervisors), *Przegląd Związkowy* (Warsaw), Vol. 14, No. 1, January 1962, p. 23–4.

The bodies responsible for the preparation and holding of master-craftsman examinations are the State Commissioner's Office and the Examination Commission. To be admitted, candidates must have successfully passed their final apprenticeship examination, practised their trade for five years and be over 24 years of age.[1]

Under the 1964 Rules of Admission to Specialized Secondary Schools in the U.S.S.R., candidates admitted to entrance examinations are divided into two different groups, according to their level of general education: students who have not continued their studies beyond the eight compulsory classes; students holding certificates from general secondary schools including final secondary classes (ninth to eleventh year).

Candidates for full-time studies must not be over 30; there is no age limit for those wishing to take evening or correspondence courses without interrupting their production work. The following candidates, listed by order of priority, are given preference in admission to full-time studies:

Workers sent by undertakings and having at least two years' practical experience in the branches concerned.

Army and navy ex-service men, who have served at least two years.

Workers with practical experience (at least two years) of working in the national economy.[2]

Lastly, an Austrian law and a law of the Federal Republic of Germany will serve to illustrate the case of laws governing specific sectors of the economy which incorporate provisions in regard to middle-level personnel.

The Austrian Federal Act of 14 July 1965 Amending the Act on the Training of Workers in Agriculture and Forestry regulates, among other things, the training of foremen in sylviculture and other specialized branches of agriculture. Any worker who has been employed for four years as a skilled agricultural (or forestry) worker, and who has successfully passed through an agricultural technical school (or technical forestry school) or an equivalent course, may sit for the foreman's examination. Attendance at a technical forestry school is not required of persons who have worked at least eight years in forestry.[3]

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1. Luxembourg, 'Règlement Ministériel du 24 Mars 1962 Fixant le Programme et la Procédure des Examens de Maîtrise', *Memorial* (Luxembourg), A, No. 17, 13 April 1962, p. 229–36.
2. U.S.S.R., 'Pravila Priema v Srednie Special'nye Učebnye Zavedenija SSSR na 1964 God' (1964 Rules of Admission to Specialized Secondary Schools in the U.S.S.R.), *Bjulleten' Ministerstva Vysšego i Srednego Special'nogo Obrazovanija SSSR* (Moscow), No. 5, May 1964, p. 2–9.
3. Austria, 'Bundesgesetz vom 14. Juli 1965 mit dem das Land- und Forstwirtschaftliche Berufsausbildungsgesetz Abgeändert Wird' (Federal Act of 14 July 1965 Amending the Act on the Training of Workers in Agriculture and Forestry), *Bundesgesetzblatt für die Republik Österreich* (Vienna), No. 65, 3 August 1965, p. 1114–16.

In the Federal Republic of Germany, the Law of 9 September 1965 Concerning the Organization of the Artisan Trades as at 28 December 1965 contains provisions regarding the examinations for the master-craftsman's certificate in this sector. German law defines differently the master-craftsman in artisan trades, who is usually proprietor and manager of a workshop (*Handwerkmeister*), in manufacturing industry (*Industriemeister*), in the printing industry (*Lehrmeister im gräphischen Gewerbe*) and in the building trades (*Baumeister*), depending on their historical origin and actual functions. The title 'master-craftsman' (*Meister*) is protected by law:[1]

> The purpose of the master-craftsman certificate examination [in the artisan trades] is to find out whether the candidate would be able to run his own business and provide adequate training for apprentices. The examination seeks, in particular, to determine whether the candidate would be competent to carry out appropriately all the tasks normally involved in his trade, and whether he is technically competent and has sufficient knowledge of business management, commerce, law and vocational training methods. Only persons with several years' experience as journeymen are eligible to sit for the master-craftsman certificate examination. A period spent attending a technical college (*Fachschule*) may be taken into account, in part or in full.[2]

Mention should be made, within the context of this chapter, of a pamphlet published by the French Employers' Association on the question of adult training, further training, retraining and upgrading in the six countries of the European Community. This pamphlet contains sections dealing with legal provisions and the general policy in regard to further training and upgrading, conditions of admission, organization and curricula, financing and the difficulties that have arisen; there is also a section on statistics.[3]

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1. Hoffman, op. cit.
2. Federal Republic of Germany, 'Gesetz zur Ordnung des Handwerks (Handwerksordnung) vom 9. September 1965 in der Fassung vom 28. Dezember 1965' (Law of 9 September 1965 Concerning the Organization of the Artisan Trades as at 28 December 1965), *Bundesgesetzblatt* (Bonn), Vol. I, No. 1, 8 January 1966, p. 1–33.
3. France, Conseil National du Patronat Français, *Formation, Perfectionnement, Reconversion, Promotion des Adultes dans les Six Pays de la Communauté Européenne*, Paris, 1963, 89 p.

Chapter 5

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Training, development levels and economic sectors

Various approaches might have been adopted in this chapter. The information compiled might have been classified according to the type of training (with a further distinction being drawn between its purpose and the way in which it is organized), according to the different categories of middle-level personnel for whom such training is designed, according to the level of development of the countries in which it is provided or again according to the economic sectors in which the middle-level workers in question are employed.

The approach finally adopted is as follows: once the different types of training have been defined, the data presented by way of illustration is grouped together, firstly, according to the level of economic development of the countries in question, then, for each group of countries at the same development level, by reference to the three conventional economic sectors (primary, secondary and tertiary).

In the literature on training, the most varied terms are still employed in the most varying senses. It was in view of this fact that an attempt was made to formulate standardized definitions in the introduction to the CIRF Abstracts, which are issued periodically as a CIRF publication of the International Labour Office. The various types of training can be classified according to their purpose or the way in which they are organized.

As regards the purpose of training, the following different types of training intended for, among other categories, adult middle-level personnel, can be distinguished: [1]

Further training: This term is used in two ways. It may denote (1) that part of vocational training which immediately follows basic training, within the framework of training for a recognized qualification, or (2) a global term for all the forms of training illustrated below. . . .

Specialized training: Training given to consolidate, deepen and broaden the knowledge and skills acquired during basic training, bringing the workers' level of skill up to the level of qualification required in a recognized trade or occupation. . . .

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[1] The quotations which follow have been taken from the Introduction to Volume 8 (1969) of *CIRF Abstracts*.

Upgrading: Training for supplementary knowledge and skills in order to increase the versatility and occupational mobility of a worker—sometimes referred to as supplementary training. It may, but will not necessarily lead to promotion. . . .

The term *training for promotion* is reserved for the cases where it is possible to distinguish specific, systematic programmes of supplementary training organized expressly with a view to promoting workers to a position of greater responsibility or at a higher hierarchical level implying a change in functions (e.g. semi-skilled to skilled worker, skilled worker to foreman, stenographer to secretary). ...

Updating: Training to bring the knowledge and skills of workers up to date with respect to new developments—new materials, tools, processes, etc.—in their occupation. . . .

Refresher training: Training to refresh knowledge and skills which may have been partly forgotten as a result of lengthy interruptions in occupational life. . . .

Retraining [This term is synonymous with mid-career training]: Training for the acquisition of the knowledge and skills required in an occupation other than the one for which the person was originally trained. This training is often given in the form of *accelerated training* (sometimes called 'analytical training') which is characterized by special selection of the trainees and by a building up of the programme on the skills and knowledge the workers already possess.

As regards the way in which training is organized, the following main types can be distinguished:

Institutional training.

In-plant training: Any part of vocational training that is provided on the premises of an undertaking, whether given in a training workshop or on the job [see below]. This term is often used in a very general sense to imply any training that is not given in a school or a training centre. . . .

On-the-job training: Training arranged at an ordinary workplace and using actual jobs of commercial value for instruction and practice purposes. . . .

Group training: A scheme in which several undertakings associate for the purpose of carrying out jointly certain training functions which individually they would either not be able to undertake or would be less well equipped to do so. . . .

Full-time training: Training course which takes place during normal working hours and for five (or six) days a week. . . .

Part-time training: A course of training so arranged that it occupies only part of the work week or work year, or is run entirely outside normal working hours (e.g. evening classes and correspondence courses). Attendance at part-time courses may be arranged through a system of release from regular work for a number of hours each week (*day release*) or for a number of weeks each year (*block release*).

For purposes of comparison, two other systems of classification may be mentioned very briefly, the first embracing training schemes as a whole, the second being designed specifically for application to the further training of qualified personnel.

The French authorities responsible for vocational training use the following typology in regard to training schemes: [1] (a) vocational and technical training for young people taking up employment; (b) training schemes designed to facilitate the retraining of employed workers; (c) so-called 'preventive training' schemes intended to obviate the need for vocational retraining—by means of appropriate supplementary training courses; (d) updating and refresher training schemes; (e) further education schemes for social advancement.

Apart from the first, all these types of training are intended equally for adult middle-level personnel and for candidates for promotion to this category of workers.

In a short work on the further training of qualified personnel, a French expert distinguishes the following types of further training: [2] (a) acquisition of specialized training; (b) maintenance of a satisfactory standard of proficiency in a specialized field: further vocational training; (c)maintenance of a satisfactory general basic level of proficiency: continuous basic training; (d) preparation for new responsibilities: training for promotion and professional advancement; (e) retraining.

After these few remarks on the terminology used in connexion with the various types of training, we shall continue by reviewing a series of examples of training courses for adult middle-level personnel, classifying them by development level and by economic sector.

In view of the fact that training schemes at various levels are in many cases closely interlinked and that a single institution frequently trains both adults and adolescents, it is inevitable that from time to time we shall exceed the scope of our subject, namely the training of adult middle-level personnel.

Underdeveloped countries

Generally speaking, the training and further training of adult middle-level personnel does not, in these countries, occupy the place is should. Yet, adult training at all levels could provide one of the keys to the

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1. Raymond Poignant and Guy Métais, 'L'Avvenire della Formazione Professionale e Tecnica nei Paesi della Comunità Economica Europea' (The Future of Vocational and Technical Training in the European Economic Community Countries), *Convegno Internazionale sulla Formazione Professionale in Europa, Roma, 1969*, Rome, UNITESA, 1969, 59 p.
2. Raymond Vatier, *Le Perfectionnement des Cadres*, cf. p. 68-82, Paris, PUF, 1969, 125 p. (Collection *Que Sais-Je?*).

development of the underdeveloped countries' human resources. In the case of middle-level personnel, the scant number of persons with sufficient educational qualifications to be able to benefit from such training is, it must be said, a serious handicap.[1]

Certain non-technical aspects of the training of qualified personnel in a newly independent country are dealt with in a chapter dealing with the training of qualified personnel and traditional values in an account of its activities published by the Economic and Social Council of Cameroon.[2]

Primary sector

There would appear to be rather a paucity of literature on the subject of the training of middle-level personnel in the primary sector in underdeveloped countries. References can, admittedly, be found to several agricultural extension services whose activities have met with success [3] but no particulars are furnished with regard to the organization of such training. We are thus limited to a large extent to the reports of national, regional and international experts, and these reports analyse the present situation and discuss what should be done rather than what has already been done. In his monograph on the training of qualified African personnel for economic growth, Albert Tevoedjre emphasizes the particular urgency attending the reform of agricultural education. Elementary education should be designed to make of the school a rural development centre (with practical work and farming activities as organized in farming schools) by assigning to the teacher, who would also assist in adult education, a cardinal role in the life of the community. Youth organizations, extension services and the development of secondary rural education could all make a valuable further contribution of their own.[4] René Dumont, who also believes the rural school to be the fulcrum of agricultural progress, has put forward a case for setting up a rural teacher-training college to provide training, comprising a common basic course, followed by specialized terminal training, for all village councillors or elders, agricultural instructors, heads of rural development centres, managers of agricultural co-operatives, etc. Agricultural extension work should be developed and improved and made the responsibility of polyvalent instructors, attached to a unified rural development service. Recruitment would be facilitated by upgrading the status of these instructors and, in particular, by enabling the most competent of them to gain promotion to positions of authority. Their conscientiousness and sense of their professional responsibilities are of greater moment than the duration of their training. This should be mainly practical, centred on key points for action as identified by research; further training courses lasting two weeks should, for example, be organized annually. In order to increase their effectiveness, arrangements should in future be made for these instructors to be recruited and remunerated by the farmers' co-operatives themselves. The function of intermediary and higher agricultural education is to provide the senior instructors, who should possess highly specialized qualifications—technicians, higher technicians and university-trained staff. Such staff will also be needed for co-ordinating activities at the local level. Instruction at this level should preferably be given locally (i.e. in Africa) and neighbouring States should co-operate in establishing agricultural institutes, if possible within the framework of, or alongside, existing universities (examples might be an institute for the Sudan Sahelian savannah zone, another for the Equatorial Forest Zone of Guinea, an inter-State forestry institute, etc.). These institutes could begin by training technicians and higher technicians in a short post-secondary course lasting three years. Later on they could organize longer training (five years) for scientists and engineers.[1]

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[1] Harbison and Myers, *Education, Manpower and Economic Growth*, op. cit., p. 58–60.

[2] Cameroon, Conseil Économique et Social, *Cinq Ans de Conseil Économique et Social, 31 Décembre 1960–31 Décembre 1965*, cf. p. 137–40, Yaoundé, 1966, 162 p.

[3] See for example: Tevoedjre, *Contribution à une Synthèse sur le Problème de la Formation des Cadres Africains* ..., op. cit., p. 76, 'The function of agricultural extension work in Africa must be considered from a somewhat different standpoint to that adopted in the highly developed countries, where the profit motive underlies all practical application of scientific progress. The success of such extension work depends essentially on the quality and the persuasiveness of the educational effort, and intensive propaganda has been found to yield excellent results in Mali, Ivory Coast and Nigeria'; Harbison and Myers, *Education, Manpower and Economic Growth*, op. cit., p. 60, 'In Kenya, for example, the agricultural extension services are quite well developed.'

[4] Tevoedjre, op. cit.

In the opinion of L. Malassis, the immediate task of agricultural technical education in the developing countries

> is to produce the technicians urgently required by the agricultural sector, but at the same time it should be planned on sufficiently flexible and evolutive lines to be able to fit into the over-all system of education as soon as practicable. It is impossible to provide for the training of technicians by adapting the structures of general education: the reasons are the length of the courses (especially when teaching is not in the students' mother tongue), the frequent impossibility of installing experimental and demonstration centres near the urban teaching establishments and the paucity of agricultural teachers. On the other hand, it is necessary to combat the unwarranted foundation of unduly specialized schools and the waste and manifold difficulties this causes. Conclusive arguments for a 'common stem' at all levels for farmers, stock-breeders, foresters, agricultural engineers, veterinarians, etc., are the practicability of giving them a common basic training, the need to forge bonds of friendship between these services, and the 'global' notion of rural development. Technical education may be short (first cycle of secondary education) or long (first and second cycles of secondary education) with opportunities for first-year specialization at each

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[1] Dumont, *Développement Agricole Africain*, op. cit.

> level. The essential thing is to produce what the developing countries need most urgently, namely technicians for work on the ground, and this implies training students and teachers on practical lines.[1]

L. Malassis attaches great importance also to community development. The philosophy of community action

> is built on an all-round approach to the problem and co-ordinated action by the several specialities in rural development. . . . The specialists in health, education, primary education, adult education, domestic economy, agricultural extension work, co-operatives, etc., should conduct a co-ordinated operation at village level.[2]

Secondary sector

With regard to middle- and high-level managerial personnel (including foremen and supervisors) a remarkable job of analysis and synthesis was accomplished by the Technical Expert Meeting on Development of Managerial and Entrepreneurial Resources in Africa, held at Addis Ababa from 5 to 16 December 1966. The objectives of this meeting were 'to examine problems connected with the development of managerial and entrepreneurial resources in industry including those in the public sector in Africa'.[3]

The meeting came to the following conclusions with regard to the training and further training of managerial personnel:

> It was recognized that the exact mix of management development and training programmes and the order of priority in which they were developed would vary considerably from one African country to another depending upon the level of industrialization, the stock of professional manpower, the pace of Africanization, the ratio of public to private enterprises and the overall development policy. National management development and training programmes should be geared to the particular and most immediate needs of the country concerned which should be realistically and most rigorously assessed. The Meeting considered that further research should be undertaken to assess management training and development needs in African countries.
>
> In the development of programmes, it had to be recognized that in some countries many of the people holding managerial positions at any level were insufficiently qualified or experienced for the positions they held. The whole problem had to be treated as a matter of urgency and serious consideration had to be given to the development of accelerated training methods as a first step to raising the levels of competence of practising personnel. Management training in certain priority areas such as labour–management relations, organi-

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[1] Malassis, *Economic Development and the Programming of Rural Education*, op. cit., p. 32.

[2] ibid., p. 24.

[3] *Technical Expert Meeting on Development of Managerial and Entrepreneurial Resources in Africa*, . . ., op. cit.

zation and the control of staff might have to be started immediately in existing technical training institutions, but it was clear that this could only be a temporary measure, in view of the many specific problems to be dealt with, and that specialized centres should be set up as soon as practicable.

All programmes should include a substantial practical part, preferably carried out in the participants' own enterprises and tied to the completion of specific projects in which the theory learned in the lecture room would be applied under the supervision of the teaching staff. Programmes should include lectures and discussions on matters of general economic and social concern such as 'the national economy and its particular characteristics', 'problems of development and national development plans' in order that participants may be able to situate their firms in their national economic contexts and in relation to their specific branches of industry. Pilot enterprises into which modern organization and management methods have been introduced under the guidance of the staffs of the management development centres and against which participants in courses can compare the organization of their own firms might also be valuable.

Time-tables of courses had to be adapted to the working hours of participants and to the difficulties which managerial personnel in smaller firms might encounter in having to be absent from their work for long periods. Correspondence courses might eventually provide a measure of training to those in distant centres.[1]

With regard to the types of institution responsible for the training and further training of managerial personnel,

The Meeting concluded that there was no standard institutional form suitable for management development in all African countries. There existed in various countries throughout the Continent:

(1) autonomous government-sponsored institutions concentrating solely on the development of senior management personnel;
(2) government-sponsored productivity centres with governing or advisory councils in which employers' organizations, trade unions and other interested bodies were represented;
(3) government-sponsored institutions which included services to small and artisan industries;
(4) government-sponsored small industry institutes in which management training was carried out alongside technical training and extension services;
(5) privately-run professional associations which provided or sponsored management development programmes;
(6) institutes or departments of universities providing some post-experience courses.[2]

In countries where there is more than one institution operating in the same field or in allied fields, close co-operation between them is essential

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[1] *Technical Expert Meeting on Development of Managerial and Entrepreneurial Resources in Africa*, . . . , op. cit., p. 14.

[2] ibid., p. 15–16.

(a proliferation of institutions would be a luxury that few African countries could afford). Experience has shown that the following conditions must be fulfilled if these institutions are to prove a success: (a) appropriate choice as to the form of organization; (b) the administrative placement of the institution where it is likely to be most acceptable and effective—involving adequate autonomy and representation of interested parties including employers' and workers' organizations; (c) the choice of effective national leadership for the project; (d) the adjustment of salary scales in the new institution so as to make it possible to attract the best local talent likely to develop into creative professionals in the management training field, within the established scale of priorities in the country concerned.

With regard to curricula and training methods, the meeting came to the following conclusions:

> Curricula should be based on a thorough investigation of conditions in industry and commerce in the country concerned and should never be imported wholesale from abroad. The design of programmes should be flexible and the result of a continuous dialogue between the trainers and those whom they serve, namely the nation's managers. Initial programmes must be designed to meet the real needs of management at the start of the training operations and take account of the levels of education and experience of those to be trained. In certain countries this might mean that early programmes had to be very simple, but the levels of complexity and sophistication might be progressively raised as managerial personnel gained experience in the application of modern management techniques so that, when a management development centre was in full operation, it might be running a range of programmes at various levels. ... Teaching materials and methods had to be developed locally in every case. ... The Meeting also noted with interest the experiments carried out by certain management development institutions in Africa to link formal off-the-job training with on-the-job coaching in a variety of forms. It was concluded that this type of training might be used with advantage on a wider scale in Africa as it accelerated the acquisition of experience and related training to actual performance.
>
> The integrated management development approach appeared to be one which had great possibilities in Africa. This approach, which involved focusing a management development programme on the enterprise, had been successfully used in an African country (National Institute of Management Development, Cairo, UAR) and in Asia (Indian Institute of Management, Ahmedabad, India). It promised the advantages for management development institutions that it could enhance their effectiveness and impact, accelerate staff development and avoid unnecessary and costly proliferation of institutions, which might result in a multiplicity of weaker rather than fewer and stronger programmes.[1]

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[1] *Technical Expert Meeting on Development of Managerial and Entrepreneurial Resources in Africa*, ..., op. cit., p. 16–17.

The final report of the Addis Ababa Meeting contains several national reports, which have the great virtue of being drafted by national experts and may usefully be consulted:

'Brief Survey of Managerial Needs in Commerce and Industry and of Training Programmes in Niger', by B. Kane (Niger).

'Problems of Management Development in Zambia', by D. Phiri (Zambia).

'The Development of Managerial and/or Entrepreneurial Resources in Industry in Sierra Leone', by A. A. Tunis (Sierra Leone).

'Survey of Training Needs for Business Administration Personnel', by A. Fall (Senegal).

'Development of Managerial and Entrepreneurial Personnel for Industry in Algeria', by A. Missoum (Algeria).

'Management Needs in Industry and Business in Kenya, including Small Business Enterprises' by M. A. O. Ndisi (Kenya).

'Some Aspects of the Development of Managerial and Entrepreneurial Resources in the UAR', by A. Fouad Sherif (United Arab Republic).

'Management Training Problems Related to the Development of Undertakings in Morocco', by H. Belmouaz (Morocco).

'Managerial Needs for Industry and Business including Small-Scale Enterprises in Malawi', by T. B. A. Jere (Malawi).

'The Development of Managerial Resources in Industry', by E. B. A. Essuman (Ghana).

'Development of Managerial and Entrepreneurial Resources in the Sudan', by M. Mekkawi (Sudan).

'The Development of Managerial and/or Entrepreneurial Resources in Industry in Nigeria', by C. E. Abebe (Nigeria).

'Managerial Personnel in the Private Sector and Promotion of African Enterprises', by P. Soppo Priso (Cameroon).

'The Development of Managerial Resources in Tanzania', by C. Kahangi (Tanzania).

'The Development of Entrepreneurial Resources in Somali Industry', by A. A. Khireh (Somalia).

'The Development of Managerial and Entrepreneurial Resources in Africa', by S. M. Kulubya (Uganda).

'Management Training and Development in Industry', by T. Harcha (Tunisia).

'The Need for Management Training in the Congo', by O. Manwana (Zaïre).

'Managerial Needs for Industry and Business including Small Enterprises', by G. Syoum (Ethiopia).

'Training of Management and Technical Personnel for Industry since Independence in Algeria', by B. Benzine (Algeria).

'Short Account of Management Requirements and Efforts in their Training and Development in Dahomey, by N. A. Viadenou (Dahomey).

'Management Requirements of Business and Industry in Malagasy: Problems and Outline for their Solution', by R. Randrianjafy, Malagasy (Madagascar).

Various petroleum and mining companies continue to play a cardinal part in the industrial sectors of several underdeveloped countries. Frequently, it is the companies themselves which train and provide further training for the personnel which they require. It is clear from a survey carried out by the International Labour Office on training in the petroleum industry (with particular reference to the developing countries) that the petroleum companies set up vocational training programmes of all types for adults: introductory courses, specialized training supplementary training, updating, retraining and training for promotion to supervisory grades and technicians' posts.

In the developing countries, these companies are frequently obliged to organize special general education courses in order to raise the educational level of their adult workers and to prepare them for further vocational training. The companies run fairly extensive vocational training programmes for adults; several of them have set up schools specially for this purpose. Training programmes are extremely varied as regards duration and the way in which the courses are organized (they may be full-time or part-time, optional or compulsory, organized on the job or outside working hours, and may also vary with regard to the subjects taught and the occupations for which workers are trained, the examinations held and the certificates awarded, and so forth). This variety stems from the different requirements peculiar to each company, the varying availability of training facilities outside the enterprise and the differing economic and social conditions peculiar to each country (for example, intensive refresher courses organized by Shell-BP Nigeria, training courses for clerical workers and marketing and customer service personnel organized by Mobil Oil Nigeria, etc.).

Most companies recruit their managerial personnel through a system of promotion; a new practice is emerging, however, whereby such personnel are recruited from among the students graduating from the companies' own technical schools. In almost every company, managerial personnel receive some form of training, either before or after promotion. Such training varies in duration from case to case, ranging from full-time courses lasting a few days only to part-time courses lasting three years. The only difference between the methods employed by the companies operating in the industrialized countries and those of companies operating in the developing countries is that the latter cannot call upon the training resources available externally and are obliged to provide all the requisite vocational training programmes themselves. A certain number of subjects recur in every programme (human relations, teaching methods, the principles governing organization and management, safety at work); these are supplemented by training programmes designed to meet specific requirements (job analysis, communications, legislation governing work, etc.). Some courses have a technical bias (electricity, petroleum technology, refining). Generally, courses do not lead on to an examination or to the conferring of certificates.

With regard to technicians, several companies have set up technical schools so as to be able to provide for their own needs in matters of training. Technicians who received their training outside the company are required to take a practical training course in order to familiarize themselves with the ins and outs of the petroleum industry. Trainee technicians are frequently selected from among the skilled workers; the next step for them is to follow further training courses.[1] The UNDP/ILO project in Nigeria provides an example of vocational instructor and supervisor training under an international technical assistance programme. This project comprises four training programmes: at Kaduna (federal programme), Ibadan, Enugu and Kaduna (regional programme).[2]

With regard to workers in the craft trades, a German expert has stressed the importance of middle-level workers in this category for the economic development of black Africa. An analysis of the craft trades (artisan) labour force in Togo leads, *inter alia*, to the conclusion—perhaps somewhat too closely patterned on the traditional model of certain European countries—that it would be advisable to create an association of craft trades workers whose responsibility it would be to organize, initially on an optional basis, examinations for supervisors.[3]

Tertiary sector

In the tertiary sector, the most important employers of middle-level personnel, at Level I of development, are the civil service and commercial establishments (which are frequently foreign). Like the oil companies, which have been exhaustively discussed in the previous section, commercial establishments often provide their own training for the middle-level personnel they need.

As regards the civil service, many countries have set up schools of administration for the training and further training of middle and high-level officials. A recent report on the civil service and development in black Africa lists these schools of administration, giving the following particulars in each case: date of establishment, purpose, conditions of admission, duration of studies, syllabus, diplomas awarded on completion of studies, status of students. The following schools appear in the

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1. International Labour Office, *Vocational Training for Workers, Supervisory and Technical Personnel in the Petroleum Industry, with Particular Reference to the Needs of Industrially Less Advanced Countries*, Geneva, ILO, 1966, 53 p. (Petroleum Committee, 7th Session, Report III).
2. International Labour Organisation, *Nigeria: Vocational Instructor and Supervisor Training*, Geneva, International Labour Organisation, New York, N. Y., United Nations Development Programme, 1968, 63 p. This document contains the itemized curricula and, *inter alia*, statistics and forecasts concerning middel-level personnel for 1958, 1960 and 1970.
3. Schädler, *Das Handwerk in Togo*, op. cit.

list:[1] École Royale d'Administration Publique et de Gestion des Affaires (Burundi); École d'Administration (Cameroon); École Nationale (Central African Republic); École Nationale d'Administration (Chad); École d'Administration (Gabon); Institute of Public Administration (Ghana); École d'Administration Publique (Guinea); École Nationale d'Administration (Ivory Coast); Institute of Administration (Kenya); East African College of Administration (Kenya); École Nationale d'Administration (Madagascar); Institute of Public Administration and Civil Service Advanced Training College (Malawi); École Nationale d'Administration (Mali); École Nationale d'Administration (Mauritania); École Nationale d'Administration (Niger); Institute of Administration, Zaria (Nigeria); Institute of Advanced Administrative Studies, Ibadan (Nigeria); University of Ife, Institute of Administration (Nigeria); École Nationale d'Administration (Senegal); Institut d'Études Administratives (IEAA) (Senegal); Institute of Public Administration (Sudan); Institute of Public Administration (Tanzania); École Nationale d'Administration (Togo); Advanced Training Centre, Public Administration Division, Makere University College, Kampala (Uganda); École Nationale (Upper Volta); École Nationale de Droit et d'Administration (Zaïre); Training and Law School (Zambia).

At an earlier stage (early in the sixties), Unesco had undertaken a series of studies on middle-level personnel requirements and the training of such personnel in a number of African countries.[2]

Partially developed countries

Generally speaking, it can be said that, despite the existence of a considerable number of institutions for the training and further training of adults, the partially developed countries have not yet succeeded in providing sufficiently comprehensive and intensive training for adult middle-level personnel. As in the Level I countries, large industrial and commercial establishments (often managed by expatriates) train many of their own skilled workers, supervisors, technicians and middle-level managerial personnel. Public administration schools and, in some cases, the armed forces and local industrial employers also contribute towards the training of middle-level personnel.[1]

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[1] Teresa Campostrini, *Fonction Publique et Développement—Afrique Noire Anglophone, Madagascar*, Paris, IRFED, 1969, 90 p. plus appendixes.

[2] Antoine Bernard, *Les Problèmes Posés par la Préparation Accélérée en Afrique Tropicale des Cadres Moyens à Compétence Principalement Administrative ou Juridique*, Paris, Unesco, 1963, 71 p. plus appendix (mimeo.) (doc.Unesco/SS/Afrique/Cadres Moyens/7) and *Les Problèmes Posés par la Formation des Cadres Administratifs dans Certains Pays d'Afrique Tropicale (République Centrafricaine, Congo (République Populaire du), Gabon, Niger, Tchad)*, Paris, Unesco, 1964, 54 p. plus appendix (mimeo.) (doc. Unesco/SS/Afrique/Cadres Moyens/8); Derek T. Healey, *Report on Middle-grade Officials in Africa: Kenya*, Paris, Unesco, 1964, 11 p. plus appendixes (mimeo.) (doc. Unesco/SS/Afrique/Cadres Moyens/9) and *Report on Middle-grade Officials in Africa: Sudan*, Paris, 1964, 7 p. plus appendix (mimeo.) (doc. Unesco/SS/Afrique/Cadres Moyens/9); Unesco, *Étude sur la Formation des Cadres Moyens au Mali*, Paris, 1961, 28 p. (mimeo.) (doc. Unesco/SS/Afrique/Cadres Moyens/1, Prov.), *Survey for Unesco of the Demands and Training Facilities for Medium-level Non-technical Personnel in the Federation of Rhodesia and Nyasaland*, Paris, 1962, 18 p. (mimeo.) (doc. Unesco/SS/Afrique/Cadres Moyens/2 Prov.) and *Enquête Établie à la Demande de l'Unesco sur la Préparation des Cadres Moyens au Sénégal*, Paris, 1962, 21 p. (mimeo.) (doc. Unesco/SS/Afrique/Cadres Moyens/4 Prov.).

The People's Republic of China is an outstanding exception. In this country, work ties in closely with education. Not only is it normal and current practice for adult workers to continue to attend educational institutions, but the opposite is also true: productive labour is a subject in the study and training curricula at the various levels of education. There is a very pronounced tendency to force every establishment to operate its own training programmes and even schools.[2]

We have an example of an institution which trains managerial staff for the various economic sectors in the École Nationale de Promotion Sociale of Madagascar, which originated in a managerial training centre. The École Nationale de Promotion Sociale now provides both extended vocational training courses and lifelong education (refresher and updating courses), by organizing short study sessions, radio programmes and correspondence courses, and by disseminating documentary material. The École Nationale de Promotion Sociale is particularly concerned with the training of training staff and the training of adults capable of tackling development problems. The school comprises four departments:

The Training for Development Department is primarily concerned with the training of existing managerial staff with a view to preparing them to become training staff. Each of the training sessions (which are held in the various provinces) is followed up by a drive to promote the formation of local groups of training staff and, if possible, of local associations for training for development. A one-year training course is provided for the regional delegates of the Rural Promotion and Literacy Board. This course consists of alternate cycles of theoretical training given in a residential college and of practical field-work.

The Advanced Training Department for Higher and Middle-Level Administrators organizes various advanced training sessions, intended in particular for subprefects, district leaders, mayors, deputy mayors and municipal council secretaries of rural communes. The work of these sessions is supplemented by publications, University of the Air broadcasts and correspondence courses involving written work.

The Co-operative Training Department provides a two-year training course for the officials of the co-operative movement, which, by the end of the first Five-year Plan, should be in charge of the marketing of half of Madagascar's agricultural produce. The department also provides lifelong education for the officials of the co-operative movement.

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[1] Harbison and Myers, *Education, Manpower and Economic Growth*, op. cit., p. 90.

[2] ibid. See also: Immanuel C. Y. Hsu, 'The Impact of Industrialization on Higher Education in Communist China', in: Harbison and Myers, *Manpower and Education* . . ., op. cit., p. 202–31.

An Information Personnel Training Department provides training and further training for the press officers of ministries and embassies, as well as newspaper journalists and radio reporters (and, subsequently, television reporters).[1]

Primary sector

There seems to be as little literature in regard to actual experience in training middle-level personnel for the primary sector in partially developed countries. To avoid repeating a great deal of what has been said in the section dealing with the training of primary-sector middle-level personnel in these countries, a few brief remarks only will be made. Partially developed countries also are urgently in need of staff for their agricultural extension and community development services. For the suggested solutions to meet these needs, the reader should therefore refer to the corresponding section on Level I countries. An example of training middle-level agricultural personnel in a country which has reached Level II (Tunisia) has been given in Chapter 3 (statistics).[2]

Secondary sector

The training of technicians is so important that it is tackled not only at national and international (technical assistance) level but also at regional level. For example, a colloquium, sponsored by the Colombo Plan Bureau, was held at New Delhi in April 1965 to consider all aspects of the training of technicians and middle-level technical personnel throughout the South-East Asia region. The colloquium showed that one serious obstacle to vocational training in almost all countries of South and South-East Asia was the lack of effective co-ordination between governmental institutions and industry. It recommended that machinery should be established to further the development of a close tripartite liaison between government representatives and representatives from education and industry.

The 1964 *Handbook of Training Facilities* published by the Colombo Plan Bureau shows that the majority of training takes place in colleges and schools and that opportunities for factory training account for less than 8 per cent of the total. The number of industrial training programmes (training on the job and sandwich courses) should be increased. Seeing that the economy of certain countries depends chiefly on a single product (jute in the case of Pakistan, rubber in the case of Malaysia, etc.), each country could establish a centre to train the necessary qualified manpower for the basic product on which its economy depended and open this centre to foreign students. This would bring about a regional division of labour in technical education and training. More efforts should be made to introduce standardized examinations at all levels. Certificates awarded as a result of regional exchanges should give a clear indication of the standard attained. They should be worded in internationally recognized technical terms.

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[1] Madagascar, *L'École Nationale de Promotion Sociale*, Tananarive, Université de Madagascar, 1965–66, 98 p.

[2] See: Zghal, 'Cadres et Ouvriers Qualifiés ...', op. cit.

Two bodies play a special part in the training of personnel for Asia. The Economic Commission for Asia and the Far East (ECAFE) encourages the development of training opportunities by: establishing regional training institutes or by organizing regional training centres; organizing study courses or study trips and by establishing training programmes; employing regional advisers; encouraging the planning at national level of training programmes which take into account known needs and the training facilities available in the various countries.

The Asian Productivity Organization (APO), which is an intergovernmental organization, believes that the training of instructors plays an essential part in improving the manpower component of productivity. Training programmes embrace various countries and their organization is centralized for all APO Member States. Where training is concerned, APO makes a distinction between upgrading and further training for managerial staff.

The report on the colloquium contains statements on the training opportunities available in the following countries: Afghanistan, Bhutan, Ceylon, India, the Republic of Korea, Malaysia, Maldive Islands, Nepal, Pakistan, Philippines and the Republic of Viet-Nam.[1]

The education and training of technicians was also the subject of a conference held at Huddersfield (United Kingdom), in October 1966, sponsored by the Commonwealth Education Liaison Committee. This conference accepted a broad general connotation of the term 'technicians', applying it to the spectrum of occupations lying between the craftsmen, on the one hand, and the professional (or technologist) on the other.

Every technician course should comprise not only instruction in the theory needed for a proper understanding of the techniques to be mastered, together with laboratory and experimental work, but also practical instruction enabling the technician to acquire the necessary skills, humanistic studies and general education mainly concerned with written and oral communication.

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[1] *Colloquium on Intra-regional Technician Training*, Colombo, Colombo Plan Bureau, 1967, 149 p.

There is a need for more research on the relative effectiveness of the different types of course and on the length of time required for training. A course might be shortened if teaching techniques were improved and post requirements precisely evaluated. Correspondence courses could play a significant part in areas with a scattered population.

The participants in the Huddersfield conference agreed on the need for close collaboration between employers and educational institutions in the selection of technicians. Entry to a technician course requires an academic standard approximately equal to the British General Certificate of Education (GCE), 'O' level, which is reached at the end of the junior secondary education period. It is probable that, in many countries, only a few student technicians will have attained the required standard in the general secondary education system; it will therefore be necessary to provide a pre-technician course similar to 'late beginners' courses.[1]

The vocational training activities of the State Secretariat for Youth, Sports and Social Affairs (SEJSAS) of Tunisia afford a good example of a training system in which the different methods are combined in a coherent whole, thus serving as an effective tool in the implementation of employment policy and the expansion of the modern sector of the economy (which only represented 10 per cent of all enterprises in the mid-sixties).

This system includes the following types of training: pre-apprenticeship, apprenticeship, vocational training for adults (both polyvalent and job-oriented), further training and advanced training. The last two types are of particular interest for the present study (although further training is more applicable to skilled workers and advanced training to management personnel; it may be asked whether a special type of training and further training should not be designed for adult middle-level personnel).

With regard to workers in employment, further training performs the following tasks:

From time to time workers are called in by further training centres to take courses in new techniques in their field of activity in order to increase their knowledge. This is an effective way of combating one feature of unemployment which is particularly common in rapidly developing countries, namely loss of occupational skills.

In facilitating the acquisition of new skills (retraining), further training helps to modernize traditional structures and increases job mobility.

The principal purpose of advanced training, instituted at the end of 1963, was to train management personnel, higher technicians and engineers. The average duration of training is six years. Classes are organized on the basis of four hours of theoretical instruction for every two hours of practical work, and the curricula are similar to those of the French Conservatoire National des Arts et Métiers. Candidates are recruited from among workers who have reached the level of the second part of the mathematics *baccalauréat*. Holders of the CAP (*Certificat d'Aptitude Professionnelle*) or of the BEM (*Brevet d'Enseignement Moyen*) are also accepted, after having taken a three-year preparatory course.

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[1] Commonwealth Education Liaison Committee, *Education and Training of Technicians* London, Her Majesty's Stationery Office, 1967, 326 p.

The training of different levels of personnel not only acts as a leaven but spreads the division of labour and thus avoids undue concentration of responsibilities in the hands of the head of the enterprise.[1]

As regards managerial staff and, in some cases, supervisors, several countries have set up business-management institutes. To take an example, let us examine the aims, organization and methods of the Management Institute of WPIDC at Karachi. This institute is the successor of the Institute of Personnel Training, set up in 1954 with the aid of the Ford Foundation, primarily for the purpose of training supervisors. Under its new name, the institute has extended its field of activity to include high-level and middle-level managerial personnel. Middle and junior management training is even regarded as being of prime importance. One of the basic principles of the institute is close co-operation with industry. The institute comprises six departments: Management Development, Industrial Engineering, Financial Management, Marketing and Sales, Labour Management Relations, and Supervisory Training. In the case of the last-mentioned department, the method adopted is to train selected industrial personnel who, in their turn, train supervisors in their own plants. This system has proved successful and will continue to be applied on an extended basis.[2]

Similar institutes exist in Latin America: for example, the Centro Nacional de Productividad (CENIP) in Peru and the Instituto Peruano para Administración de Empresas (IPAE).[3]

Tertiary sector

This section will be primarily devoted to examining the training of two categories of middle-level personnel—medical assistants, and technical and special staff in the field of export promotion and invisible transactions—in respect of whom special recommendations have been made by international organizations. These recommendations are not restricted to Level II countries. The fact that we are examining these two categories in detail must not, of course, give the impression that the training of other middle-level personnel in the tertiary sector is any less important.

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[1] Cherif Hamza, 'Bilan Triennal de la Formation Professionnelle', *Progrès Social* (Tunis), new series, No. 2, 1966, p. 5–31.

[2] I. H. Khan, 'Management Institute. Aims, Objectives and Methods', *Pakistan Productivity* (Lahore), Vol. 3, No. 2, April–June 1965, p. 27–34.

[3] William Foote Whyte (with the collaboration of Graciela Flores), 'High-level Manpower for Peru', op cit., in: Harbison and Myers, *Manpower and Education* . . ., op. cit., p. 45.

The World Health Organization Expert Committee on Professional and Technical Education of Medical and Auxiliary Personnel made recommendations on the training and utilization of medical assistants and similar personnel whose duties characteristically include limited responsibility for deciding on the diagnosis and treatment of patients.

The term 'medical assistant' is used to mean a health worker who has received an appropriate training and who, in the field of promotion, protection and restoration of health has certain clearly defined duties and responsibilities. He is employed within an organized health service under the supervision and guidance of qualified physicians, to whom he must refer all difficult cases.

The following considerations relating to the functions and training of medical assistants apply—*mutatis mutandis*—to other categories of middle-level personnel and are therefore of general significance.

There is no uniform type of medical assistant for all countries. The programme of training and of utilization is related to such factors as the local mores, social conditions, patterns of health services, the nature of health problems or the types of disease peculiar to each country.

According to the level of training, which varies from one country to another, the medical assistant will be either a high-level auxiliary, or an auxiliary of a lower type (or to use the terminology adopted in this work, senior or junior middle-level personnel). The level of general education required before a medical assistant can begin technical training may range from a few years of primary school to complete secondary school education. The length of technical training may vary from a few months to a few years.

When a training programme proves unsatisfactory, it is usually because, in defining the objectives, insufficient attention was paid to the duties required of medical assistants. It is not possible to prescribe a universally applicable curriculum, but the following are some considerations that may be useful in drawing up programmes to meet local conditions and local needs:

A number of simple functions usually performed by physicians can be delegated to medical assistants, within an organized health service providing for supervision of the activities of these assistants.

A medical assistant is an auxiliary health worker; he should be recognized as such and employed only in that capacity.

The type of medical assistant needed in a country must be determined in the context of total health planning.

The training programme must be planned according to the duties expected of the medical assistant.

No training programme is applicable to all countries: programmes should be formulated to meet specific needs.

Training programmes should be based on pedagogical principles, the objectives, content, teaching methods and criteria for the measurement of student performance being determined in advance and adhered to; they should be efficient, effective, economical, and, above all, practical.

Programmes should not be modelled on those for medical students.

Criteria for admission to training should be determined by the type of programme and by the availability of candidates.

Programmes should be evaluated continuously and, if necessary, modified or discontinued.

Automatic upgrading of medical assistants to the level of fully qualified physicians should not be allowed.

However, career incentives should be provided. Selected medical assistants should have access to additional training enabling them to: supervise and guide other medical assistants; become instructors in medical assistant training programmes; and gain competence in a particular field.

When a medical assistant training programme is being prepared, arrangements must be made to: enlist the support of the medical profession; advise physicians on the functions they may delegate to medical assistants; explain to physicians what is required of them in supervising the work of medical assistants; and provide referral services whereby the medical assistants refer to physicians those cases they cannot handle themselves.[1]

The United Nations Conference on Trade and Development (UNCTAD) adopted, at its session held in New Delhi from 1 February to 29 March 1968, a resolution on the training of technical and special staff in the field of export promotion (marketing techniques, methods of financing, publicity) and invisible transactions, including shipping, insurance and tourism:

> Recognizing the need for action to promote the expansion of foreign trade of the developing countries and, consequently, of economic and social progress in these countries, and recalling the resolutions previously adopted (*inter alia*, by the General Assembly of the United Nations and the Economic and Social Council), recommending joint action within the United Nations family, the Conference:
>
> Took note with satisfaction of the establishment of an export promotion programme;
>
> Invited the Secretary-General of the United Nations to prepare, in co-operation with the Secretary-General of UNCTAD and the executive heads of other

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[1] World Health Organization, *Training of Medical Assistants and Similar Personnel: Seventeenth Report of the WHO Expert Committee on Professional and Technical Education of Medical and Auxiliary Personnel, Geneva, 4–8 September 1967*, Geneva, 1967, 26 p. (Technical Report, 385). This report contains, in Annex 1, two examples of functions delegated to medical assistants and, in Annex 2, training examples from six countries.

TE INSTITUTE OF EDUCATION

> competent organs of the United Nations, particularly the United Nations Industrial Development Organization (UNIDO), the specialized agencies concerned and related competent bodies, a programme of integrated action on the problem of vocational and technical training for the range of activities connected with export promotion.

The main aims of this programme would be as follows: (a) defining priority objectives for the activities of the international bodies in these fields together with appropriate means of attaining those objectives; (b) co-ordinating and rationalizing technical assistance activities undertaken in this field at international level; (c) aiding the developing countries to obtain information about sources of bilateral or multilateral assistance available in these fields.

The conference further invited the Secretary-General of the United Nations and the executive heads of the specialized agencies concerned to give all due consideration to requests from developing countries for technical assistance in matters relating to the training of technical and special staff in the field of export promotion.[1]

Semi-advanced countries

Broadly speaking, it can be said that, in some of the semi-advanced countries, more attention is being paid than in the past to ways of upgrading the qualifications and improving the performance of managerial personnel employed in strategic occupations.[2] In the Eastern European countries, most of which are at this stage of development, a full-time or part-time job is frequently combined with a secondary or higher education course, but there are also other countries, as will be seen in this chapter, which are making considerable efforts in regard to the training of adult middle-level manpower.

Primary sector

The agricultural sectors of some semi-advanced countries bear a resemblance, in fact, to those of less developed countries. In these cases, appreciably the same need is felt for middle-level manpower. In India, for example, there is a persistent shortage of trained agricultural managerial staff. By the end of India's second Five-year Plan (1961), there was a shortage of 6,500 extension personnel in the agricultural and community development programmes, or almost 10 per cent of the total posts in this category sanctioned in the plan.[3]

At this level of human resource development, we find countries as different as India and Poland or Thailand and Czechoslovakia. The example of Poland will serve to illustrate the case of the countries at the upper end of the range of semi-advanced countries.

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[1] United Nations Conference on Trade and Development (UNCTAD), *Resolution concerning the Training of Technical and Special Staff in the Field of Export Promotion*, Geneva, 1968, 2 p. (document TD/11/RES/1, 22 March 1968).

[2] Harbison and Myers, *Education, Manpower and Economic Growth*, op. cit., p. 121.

[3] ibid., p. 123.

Out of the 40,000 technical or 'specialist' staff (graduates of university or technical college (*technikum*) level) working in agriculture in Poland around 1968, 65 per cent were working in rural districts as agronomists, animal husbandry technicians and other production workers and 35 per cent were employed in rural administration, as teachers or in research establishments. The number working in production is not enough to meet current requirements and the proportion should be increased by a corresponding reduction of the number in work outside production. In view of the importance of the teaching function and of experimental research for agricultural development, the reduction should be made in the administrative branch rather than in these two sectors.

The agricultural technical colleges annually supply on average 5,500 graduates of secondary level. If the 1,500 who must be expected to go on to university courses are deducted from this total, there are left annually 4,000 newly qualified technicians available for agricultural employment. This, however, is a hypothetical estimate that does not take into account the substantial proportion (up to 45 per cent) of women among the newly qualified technicians. Nearly half these women subsequently give up work in the occupation learnt, especially jobs directly connected with production, such as agronomists, animal-husbandry technicians, etc. This is due to the difficult working conditions, generally irregular hours, frequent travelling, etc., that often cannot be fitted in with family responsibilities, especially for mothers with young children. To avoid this waste of training, the girls who are interested in technical agricultural courses should be better informed re the conditions of their future work. After taking into account the probable number of technicians unlikely to practise their occupation and those who will go into teaching or research, the total number of technicians available for production work in rural districts may be estimated at 9,000 for the last three years (1968–70) of the current Five-year Plan. To ensure that the services of agricultural specialists are used in a more rational way, it is also necessary to overcome the lack of geographical balance in their distribution, which has favoured the more highly developed rural districts, situated near urban transport networks, at the expense of less attractive, more distant regions where the land is more difficult to cultivate.[1]

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1. Jósef Okuniewski, 'Właściwe Wykorzystanie Kadr Specjalistów jako Czynnik Rozwoju Rolnictwa' (The Planned Use of Specialists—a Factor in Agricultural Development), *Nove Drogi* (Warsaw), Vol. 22, No. 4, April 1968, p. 116–25. As regards the training of middle-level agricultural staff in semi-advanced countries, see also: Fekete, 'A Mezögazdasàgi Szakember Ellátottság ..., op. cit. (The substance of this article has been summarized in Chapter 3, which deals with middle-level personnel statistics.)

Secondary sector

In this section, we shall examine, in some detail, the training of certain categories of adult middle-level personnel in three countries (India, Poland, Italy); additional information concerning a number of other countries will also be given.

In the case of India, the New Delhi Institute of Applied Manpower Research conducted a survey, in September 1965, on training facilities for managerial manpower. The replies to the questionnaire were classified in several different ways, enabling the following classification of training programmes to be compiled:

A. By types of organization offering the programmes:
   (a) Universities—normally special departments of business administration, management or commerce.
   (b) Technical institutions or colleges—normally institutions of higher technology or engineering.
   (c) Special training institutions—they may be institutions for management training, or specialized institutions on industrial engineering, work study, etc.
   (d) Professional societies—such as management associations or associations in the field of personnel management, production management, material management, financial management, sales management, etc. Within this category may be listed research associations also.
   (e) Promotional or developmental bodies—mostly those set up by the government—such as productivity councils, small industry development bodies, etc.
   (f) Employers—either individually or collectively, mostly offering developmental courses for their own employees.
   (g) Private consultants—some consultants also organize specialized courses on a fee-charging basis.

B. By types of courses or programmes:
   (a) Qualifying programmes offered as pre-employment courses for the development of first-level recruits to executive cadres. These are usually long-term courses of nine months or longer.
   (b) Programmes for developing specialist knowledge of junior ranks for executive personnel who have not undergone such a programme as part of their pre-employment educational preparation. These are usually medium-term courses of about one month and above. These programmes are essentially for practitioners in their specialized areas of activity.
   (c) Programmes of a short-term nature for bringing specialist managerial personnel up to date on new techniques applicable to their fields of work. These may last anywhere from three to four days up to two to three weeks.
   (d) Programmes meant for senior and top-management levels for updating their knowledge on new developments in a wide spectrum of activities

which they have to deal with and for which they call in specialist staff, or for informing practitioners in one activity group about developments in related activity groups so as to improve understanding and communications in industry. These programmes may last one evening to one to two days. Within this type may be courses of a more intensive type which may last two to four weeks mostly on a residential basis.

C. By levels of personnel participating:
  (a) For junior managerial personnel.
  (b) For middle-level managerial personnel.
  (c) For senior-level managerial personnel.
D. By type of participation:
  (a) Residential and whole-time training programme.
  (b) Non-residential, whole-time or part-time training programme.
  (c) Non-residential, examination only.

The experts of the Institute of Applied Manpower Research came to the conclusion that the most useful and efficient training programmes in the present Indian context are probably those which aim to improve the professional quality of the existing stock of managerial personnel. In 1965, the training capacity of these courses was 1,737 persons while the actual intake figure was 1,572. During the Fourth Plan, the capacity of these training courses will probably be substantially increased. This emerges from a report on the results of a survey which gives very full details regarding these courses.[1]

The Institute of Applied Manpower Research also carried out a study on the educational and training preparation of technicians in India. The objectives of this study were to: investigate the place of the middle-level technician in Indian industry; examine the current pattern of technician education and training; suggest solutions for matching middle-level technician training to industrial requirements.

International comparisons established for the U.S.S.R., India and the United Kingdom show the number of technicians per graduate engineer by the major economic sectors to be as follows:

	U.S.S.R	United Kingdom	India
Mining and manufacture	2·4	4·0	1·0
Construction	2·0	6·4	0·9
Transport	3·1	9·1	1·3
Teaching, research, services	0·5	1·3	1·7

Despite the apparent shortage of technicians in India, a very much higher proportion of technicians remains unemployed in comparison to graduate engineers. The reasons for this may be that: there is something intrinsically wrong with the educational specialization of diploma courses; the quality of the trainees is not acceptable to industry; the employment structure is such that they cannot be absorbed—graduate engineers may be filling technician-level posts.

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[1] B. L. Agarwal and M. C. Goel, 'Educational and Training Facilities for Managerial Manpower in India, *Manpower Journal* (New Delhi), Vol. 3, No. 2, July-September 1967, p. 63–113.

In this connexion, investigation of the present training structure in India shows that the main source of engineering technicians is the three-year diploma polytechnic course, with an output of 17,000 in 1965 and a projected output of 34,000 in 1975. There are also two-year technician courses (output 660 in 1965; forecast output 1,200 in 1975). The three-year and two-year courses are both institution-based and academic in content. In theory each should be followed by a two-year period of practical training in industry but in practice such training very rarely takes place. Sandwich courses for personnel already in industry have been introduced but are at present very limited.

Investigation of the training given shows that training is insufficiently specialized; the amount of theoretical instruction is insufficient; there is inadequate provision for practical training other than in the institutional laboratories and workshops; and the absence of industry involvement in the formulation or implementation of existing technician programmes has tended to lead to an imbalance between the training given and the real needs of industry.

The main recommendations made in the report of the Institute of Applied Manpower Research are as follows: courses should be redesigned as technician specialities; standards should be improved by raising the level of admission qualifications; standards should be improved by redesigning the training; the status of technician training should be improved.

The chief problem in improving technician training would appear to be to ensure closer co-operation with industry. The bulk of the admissions should be industry-sponsored, plus an additional group selected by the institutions; in this way the great majority of the trainees would be adults already in a job, contrary to what is at present the case. The establishment of separate professional associations for technicians should be encouraged; such bodies should be able to organize a scheme whereby skilled workers could obtain promotion to technician status.[1]

As in most Eastern European countries, the training and further training of adult personnel is very highly developed in Poland. Vocational training opportunities open to adults can be classified under three different headings:

1. Vocational training at schools (evening and correspondence courses). Workers' technical colleges take first place for this type of training.

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[1] Institute of Applied Manpower Research (New Delhi), *Engineering Manpower—Education and Training Preparation of Technicians*, New Delhi, 1967, 73 p. (IAMR Working Paper 1967, 2).

The present tendency is to unite under a single management evening technical schools (or their sections) and their counterparts providing correspondence courses in the same school district. The idea in grouping together training facilities for persons who are obliged to fit their studies into a working existence is to build up school units specializing in teaching of adults, since most of the adult trainees are workers. (In 1963–64, 44 per cent of the 193,000 students taking technical courses in night school or by correspondence were workers.)

The technical colleges offer one or other of the following programmes:

- A 5-year programme, for which candidates need only have completed primary education.
- A 3-year programme, for which candidates must be in possession of a certificate from a basic vocational school. It is anticipated that the number of these students, already large, will increase considerably. The programme enables workers to continue basic vocational training alongside secondary education (technical and general), thus qualifying them for a high level of skill in their trade.

2. Official skilled worker or foreman qualifications provided for by a government resolution (introduced in 1961): these qualifications can be obtained by passing examinations held by government examining boards. The number of candidates for these examinations increases steadily each year. Even so, there are still far too many production workers without any recognized qualifications (approximately 2 million in 1965). In order to remedy this situation the Ministry of Education and the Trade Unions' Central Board carried out in 1965 an energetic campaign among workers, with the assistance of the plant committees and the Socialist Youth unions, to emphasize the importance of the government resolution and the advantages to be derived from its application, and to encourage workers lacking recognized qualifications to take the examinations.
3. Training and further training courses. These are organized either by the plants or by various social or co-operative institutions, whose educational activities are supervised by the competent school authorities. Trainees taking courses of the latter type may be: recruited on the recommendation of their undertaking, in which case the latter pays for their training; or admitted at their own request, in which case the trainee pays for his own tuition.[1]

A reform of technical and vocational education has been in progress since 1 September 1967 in schools for young workers.[2] Since 1 September 1969 this reform has also been applied to adult part-time education. These latter measures affect establishments of three types:

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[1] Jan Szkop, 'Zawodowa Oświata Dorosłych' (Vocational Training for Adults), *Szkoła Zawodowa* (Warsaw), No. 5, May 1965, p. 12-17.

[2] Stanisław Dobosiewicz 'Reforma Szkoł Srednich dla Absolwentów ZSZ i SPR' (Reform of the Secondary Schools for Graduates of Basic Vocational Schools and Basic Agricultural Vocational Schools), *Szkoła Zawodowa* (Warsaw), No. 4, April 1968, p. 3–9.

Workers' technical colleges (*technikum dla pracujacych*) giving five-year courses. This part-time technical education will attract mainly adults wanting to study in the technical colleges offering courses in economics (*technikum ekonomiczne*), administrative work or in the food and clothing industries. As the educational level prescribed for admission is completion of eight years' basic common schooling, the colleges must arrange special classes up to 1971–72 for adult workers who have had only seven years or less.

Workers' technical colleges (*technikum dla pracujacych*) giving three-year courses. The instruction in these technical colleges follows on from the instruction given in the basic vocational school and therefore concerns more especially adult workers with work experience. Technician training is based on the technology of the skilled trade in which trainees are expected to be employed while following these part-time courses.

In these two types of technical college, the time allowed for evening courses should not exceed eighteen to twenty hours a week.

Workers' technical schools (*państwowa szkola techniczna*). These schools offer two-year courses for workers who have obtained the final leaving certificate (*matura*) of the general senior secondary schools. They should also be open to those who have received their secondary education (general and vocational) in the technical colleges. They should specialize in technical courses in electronics and automation. The courses should lead to the 'higher technician' qualification (*wyzszy technik*) while the courses in the workers' technical colleges terminate with the award of a technician's certificate in a particular speciality.[1]

There is close co-operation between the technical colleges giving part-time instruction for adult workers and the undertakings where the students work. Heads of technical colleges get directly in touch with the heads and staff of near-by undertakings in order to arouse keener interest in part-time study. The technical colleges send reports on course attendance and results achieved to the workshop supervisors. Experience has shown that this is the best form of co-operation in so far as improvement of the scholastic achievement of the students is concerned. The heads of the technical colleges also take appropriate action with undertakings which fail to carry out their obligations towards workers who are studying while continuing their production work (grant of more frequent holidays;

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[1] Leopold Cieplak, 'W Sprawie Zalozeń Organizacynoj-programowych Reformy Szkól-zawodowych dla Pracujacych' (Principles Governing the Organization and Curricula of the Vocational Training Establishments for Workers during the Current Reform Phase), *Oświata Doroslych* (Warsaw), Vol. 11, No. 8, October 1967, p. 427-37.

reorganization of shifts to fit in with evening course time-tables, etc.).[1]

As regards managerial manpower, Poland was one of the first countries to receive UNDP/ILO technical assistance for the establishment of a National Management Development Centre. The purpose of the centre was to assist the Polish Government in training the middle and high-level management personnel needed for the execution of its accelerated industrialization programme. During this five-year project (the centre is now entirely managed by the Polish authorities), 8,500 adult workers from various enterprises followed management training courses and seminars.[2]

As regards training methods, special mention must be made of a pilot project using television for adult technical training. This project is described in a Unesco report.[3]

Italy affords a good example of the effort that is needed in order to define more clearly the functions of middle-level technical personnel in industry and establish appropriate training machinery. Changes in the structure of industry and its need for different types and levels of skilled personnel have outstripped, instead of running concurrently with, changes in the institutions responsible for technical training. The certificates which, in 1964, could be obtained at the end of technical and vocational training comprised: certificates awarded by a vocational school (Istituto Professionale: three years' study); certificates awarded by a technical college (Istituto Tecnico: five years' study); university degree in engineering (*laurea in ingegneria*).

An inquiry carried out by the Institute for Industrial Reconstruction (Istituto per la Ricostruzione Industriale—IRI) in six mechanical engineering firms has brought out the need for two intermediate levels of certificate. The first would come between the vocational-school certificate and the technical college certificate and the second would come between the technical-college certificate and the university degree in engineering.

Holders of the former certificate would be known as 'junior technicians' (*tecnici*—or *quadri—intermedi inferiori*), holders of the second as 'senior technicians' (*tecnici superiori*, or *tecnici intermedi superiori*).

The inquiry gave the following results as regards the desirable occupational structure of technical personnel: graduate engineers should constitute about 6 per cent, senior technicians about 9 per cent; technicians from technical colleges should make up 29 per cent (no change

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1. Eliza Pisarska-Okrasowa, 'Współpraca Techników Zawodowych dla Pracujacych z Zakladami Pracy' (Co-operation between the Undertakings and Technical Colleges for Adult Workers), *Oświata Dorosłych* (Warsaw), Vol. 8, No. 5, May 1964, p. 257–61.
2. International Labour Organisation/United Nations Development Programme, *National Management Development Centre Poland*, Geneva, ILO, 1966, 71 p. (ILO/UNDP/FR/Poland 1/RL), and W. Wende and A. Ehrlich, 'The National Management Development Centre in Warsaw', *International Labour Review* (Geneva), Vol. 91, No. 5, May 1965, p. 420–5.
3. Unesco, *Television for Higher Technical Education of the Employed—A First Report on a Pilot Project in Poland*, Paris, 1969, 49 p. (*Reports and Papers on Mass Communication*, 55).

from the present situation); vocational school graduates, together with the new junior technicians, should constitute 57 per cent of technical personnel (at the present time employees with a vocational school certificate represent 38 per cent of the technical personnel); there should no longer be any technical personnel with only a middle—junior secondary—school (*scuola media inferiore*) certificate.

A special type of school ought therefore to be organized for training junior technicians. Until such schools turn out a sufficient number of such technicians, upgrading training will play a particularly important role. This does not mean that upgrading will no longer be needed once these schools have got under way, but it will have to be given a new impetus and organized systematically. At present, it is too often left to develop haphazardly and, in addition, there is a tendency to overestimate the value of practical experience.[1]

Moreover, about two-thirds of all middle-level personnel (including supervisors) are at present recruited from the ranks of the skilled workers, following promotion. In the absence of systematic upgrading training, this tradition has certain major shortcomings, for the workers singled out for promotion are often selected mainly for their seniority and loyalty to the firm. But such workers have frequently lost all spirit of initiative. Upgrading and promotion should be reserved for active dynamic workers who are of an age when they are still full of energy.[2]

As the curricula of the industrial training colleges do not include technician-level training in work study and organization, and as the training provided in this subject by some private undertakings is not altogether satisfactory, proposals have been made with a view to putting such training on a proper basis. The relevant subject-matter would be subdivided into seven specializations and training would be given at four different levels: a course for persons with an elementary school leaving certificate or its equivalent (duration of training: twelve to eighteen months); a course for persons with a technical college certificate (*industriali*) (minimum duration: six months); a course for senior technicians and young engineers (six to eight months); a course for staff occupying posts implying certain responsibilities for production (five to six months).[3]

Tertiary sector

With the exception of a work dealing, *inter alia*, with the training of managerial staff in banking establishments in India[4] and a Czechoslovak

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1. Vita, 'La Formazione dei Tecnici Intermedi . . .', op. cit.
2. Martinoli, 'I Quadri Tecnici . . .', op. cit.
3. Osvaldo Ciangaretti, 'Problemi ed Aspetti di Addestramento Professionale nell'Industria' (Problems and Aspects of Vocational Training in Industry), *Produttività* (Rome), Vol. 15, No. 4, April 1964, p. 5–15.
4. India, Planning Commission, All India Management Association, *Conference on Management in the Fourth Plan, New Delhi, 1966*, New Delhi, 1966, 6 vols.

article also covering the training of middle-level administrative staff,[1] the bibliography attached to the present study does not contain any reference material dealing specifically with the training of adult middle-level personnel in the tertiary sector in semi-advanced countries.

Advanced countries

Generally speaking, it can be said that it is in the advanced countries that the training of adults, including that of middle-level personnel, is the most highly developed, although this does not mean that it is always integrated—except in the socialist countries—into a comprehensive education and training system. Individual employers play an important part in providing such training. In-plant and on-the-job training programmes are developed to overcome the shortage of particular types of manpower. In addition to traditional training methods, business enterprises are using teaching machines, television, simulators and other advanced training techniques.

The United States has developed management training or 'executive development' through programmes jointly operated by industry and the universities. This type of training has been taken over by a large number of advanced countries (United Kingdom, Federal Republic of Germany, Sweden and Japan, in particular) and it may be said that the training and advanced training of managerial staff through internal and external programmes is a conscious policy of progressive enterprises in practically all advanced countries.

The U.S.S.R. and the socialist countries—most of which are, admittedly, Level III countries in terms of human resources development—are attaching ever-greater importance to the combination of work experience with various types of training (part-time, correspondence or evening courses, but also full-time education) provided by universities, technical institutes or other institutions.

Finally, various other types of adult training programmes play an important role in the United States or Western European countries. Examples are the agricultural extension programme in the United States, and the folk high schools of the Scandinavian countries.[2]

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[1] Antonin Bohač, 'Die Fachschulbildung in der ČSSR und ihre Probleme' (Training Problems in Secondary Technical Schools in Czechoslovakia), *Die Berufsbildende Schule* (Wolfenbüttel), Vol. 17, No. 12, December 1964, p. 838–50.

[2] Harbison und Myers, *Education, Manpower and Economic Growth*, op. cit., p. 160–3.

Primary sector

This section contains examples of the training of middle-level agricultural and forestry personnel in France, the Scandinavian countries, Switzerland, the U.S.S.R. and the United States of America.

In France, technical training for middle-level agricultural personnel is provided by agricultural secondary schools. Based in theory on the law of 2 August 1960, it was reorganized as from the beginning of the 1969 school year. It prepares students for the technical certificate in agriculture, the technical certificate with specialization in agriculture or the so-called *baccalauréat D*, by virtue of which they become high-level agricultural technicians. This type of education is, however, principally intended for young people.[1] Armand Braun's work, *La Promotion Sociale en Agriculture*, shows the great number and diversity of the efforts that are being made to promote further education with a view to social advancement in agriculture. It is difficult to draw a sharp line between middle-level training and agricultural extension work that does not lead to a higher qualification in the traditional context of adult education: the inadequate number of village schools established in the last century, the efforts of teachers and priests, the correspondence courses organized by trade unions and a few district agricultural associations as well as the schemes launched by a few isolated farmers have for long been insufficient to promote much-needed rural development. Other means have been brought to bear of which youth movement and trade-union and trade association activity may be mentioned in particular.

The youth movement, *Jeunesse Agricole Catholique*, with separate branches for young men and young women (JAC and JACF), has contributed actively to the work of rural development. Its activities include, *inter alia*, vocational training and further training for farmers through courses and lectures, etc. Efforts have been spent on extension work in modern techniques which has encouraged young farmers to assume responsibilities and take initiatives in their occupation. This youth movement has also contributed to the training of leaders in the trade union movement and trade associations.

Several trade unions and trade associations have assisted in disseminating technical education. In this field the major role was played by the Centres d'Études Techniques Agricoles (CETA), founded by groups of farmers and expanded with State aid, particularly from 1950 on. Their activities were later to have an impact on social advancement, in the broadest meaning of the word. The agricultural extension work of the agricultural advisers is supplemented by agricultural extension groups set up by the unions, by agricultural teachers and centres for agricultural promotion under the head offices of the agricultural authorities in each *département*. It has been estimated that in 1963, 10 to 15 per cent of those engaged in farming benefited from different types of extension work. A subsidy of 41 million francs was provided for this purpose in 1964. It was to be utilized to promote scientific organization of work, farm management, marketing of produce and home economics. At the present time the management of 10,000 farms is under the supervision of the Institut de Gestion et d'Économie Rurale (IGER).

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[1] Jeanne Lordon, 'L'Enseignement et la Formation Professionnelle Agricoles', *L'École Libératrice* (Paris), Vol. 29, No. 37, 15 June 1962, p. 1751–3, 1777–8.

Of the trade unions, it is the Centre National des Jeunes Agriculteurs (CNJA) that has embarked on the most wide-ranging activities in the realm of social advancement. In 1959, with the support of all the large agricultural organizations, the Institut de Formation pour les Cadres Paysans (IFOCAP) was set up and this in turn established regional centres. This institute organizes three-month courses free of charge for farmers who are or will be responsible for agricultural organizations and fifteen-day sessions for women active in trade-union affairs. IFOCAP also promotes research, particularly in teaching methods to be used in extension services for rural adults.

Of the various methods of promoting rural development the following may be mentioned: development through the co-operative movement (the movement numbers 19,000 co-operatives, with over 1,800,000 members; at the upper levels it provides training for managers); dissemination of education and culture; advancement of women; further education of wage-earners with a view to social advancement; extension services through agricultural advisers (full-length courses to train these advisers are organized by the Association de Formation et de Perfectionnement Agricoles).

The legislation on further education with a view to social advancement enacted in 1959 was also an important landmark for agriculture. Regarding training for middle-level adults in agriculture in particular, it provided for the organization of popular advanced studies (*hautes études populaires*) in the *départements* as an intermediate upgrading process possibly leading to advanced-level training. To implement this project, a national institute for the training of personnel for rural development was to be set in Dijon, as well as regional institutes.[1]

In Sweden, a 1961 report by a governmental committee on the position regarding vocational training in agriculture contained the following proposals on the training of adult middle-level personnel:

The two-year training course for foremen should be reduced to forty-two weeks. Entrance requirements: the applicant should be at least nineteen years of age, have completed vocational training and have two years' experience of agricultural work.

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[1] Armand Braun, *La Promotion Sociale en Agriculture*, Paris, Cujas, 1965, 265 p.

Participants in training courses for technicians should be at least 20 years of age, have successfully completed the course for farm foremen and have reached the intermediate school certificate level (ten years' schooling) in Swedish, mathematics, physics, chemistry, biology and English.[1]

Regarding forestry training, a conference of the Scandinavian countries was held in November 1963 to discuss various projects. In Sweden, there are two types of course: a basic training course of forty-one weeks (twenty-two weeks in the classroom, nineteen weeks on practical work), and a further training course of thirty-two weeks (twelve weeks in the classroom, twenty weeks on practical work). In addition to these courses, special courses are organized for master foresters and instructors. In Denmark, as in Sweden, the Ministry of Agriculture is responsible for training, which also consists of a basic and a further training course. To qualify for admittance to the basic training course, the candidates must have completed one year of practical experience on the job. To take the further training course they must have passed the final examination of the basic training course.

In Switzerland, an inter-cantonal agricultural technical college was founded in the early sixties to train agricultural technicians. The country's needs in graduate agronomists are estimated at approximately forty agronomists per year: the proportion of technicians required is at least two for each agronomist and the agricultural technical college should therefore admit approximately eighty pupils each year. The entrance requirements are as follows: minimum age 21 years: the candidate must have passed the final apprenticeship examination in a field related to agriculture—alternatively, he must have completed at least three years of practical agricultural work, possess the school-leaving certificate from a school of agriculture or specialized school of agriculture (or, in exceptional cases, equivalent knowledge); and he must pass the entrance examination. The curriculum of this college consists of a general part covering two semesters and a specialized part covering one or two semesters.[2]

In 1967, the first school for middle-level foresters was opened. The training covers one year and replaces the inter-cantonal four-month courses which were no longer adequate.[3]

[1] Ars Lantbruksundervisningskommitté (1955), *Lantbrukets Yrkesskolor* (Agricultural Vocational Schools), Stockholm, Statens Offentliga Utredningar, Jordbruksdepartementet, 1961, 206 p.

[2] Switzerland, 'Message du Conseil Fédéral à l'Assemblée Fédérale Relatif à un Projet d'Arrêté Fédéral Allouant une Subvention Extraordinaire aux Frais de Construction d'un Technicum Agricole et à un Projet de Loi Fédérale sur les Technicums Agricoles', *Feuille Fédérale* (Berne), Vol. 115, No. 36, 12 September 1963, p. 363–85.

[3] I. Zuev, 'Einweihung der Ersten Schweizer Försterschule' (Inauguration of the first Middlelevel Foresters' School in Switzerland), *Neue Zürcher Zeitung* (Zürich), No. 1674, 18 April 1967.

The following paragraphs on the U.S.S.R. will not attempt to describe the Soviet midde-level training system in the primary sector but will merely give two examples. One has been chosen for the unusual aspects of the training programme, the other because the kind of framework within which it operates is typical of Soviet agricultural organization.

The agricultural technical colleges operating on State farms *(sovkhozy)* known as Sovkhoz-technikum, have introduced a new practical training programme for agricultural technicians approved by the Ministry of Agriculture. Under this programme, which is spread over four years, trainees take part in a complete agricultural work cycle and in experimental work on crops. It includes the following:

Rudiments of agriculture.

Training based on a subject chosen from the theoretical syllabus (care is taken to maintain close contact between the theoretical and the practical aspects).

Training in the work of a farm labourer.

Independent manual labour: in the third year, for an eighteen-week period, students are assigned to work with agricultural labour teams or on farms. After this first experience of independent work, they write a report on the techniques employed and give their impression of the harvest and yield obtained, etc.

Training course in production management: the purpose of this course is to train technicians in agricultural organization and production and in planning and supervising the work of agricultural labour teams.

Extra training periods: to enable students to become familiar with types of work that on account of the limited amount of time available cannot be integrated in the systematic practical training programme, provision is made for them to spend working time in horticultural units, dairies, meteorological stations, etc. A special time-table is drawn up to enable each student to spend one working week in this way each year of the four-year study programme.[1]

The other example concerns the one-year courses given in schools for the practical training of managers of collective farms and State farms *(kolkhozy* and *sovkhozy)*. In these schools, which are located on model farms, instruction is based on wide-scale application of the results of pioneer research on crop-raising and livestock breeding. One-quarter of the time-table is spent on theory. During the practical training, the future chairmen of collective farms (or directors of State farms) learn the methods to be applied in farm administration and management and how to organize the farm workers. Students regularly attend training conferences that bring together the managers of model farms and, on termination of their studies, spend two weeks acting as assistants. Afterwards most of them are elected chairman of the collective farm by their rural community.[1]

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[1] Z. E. Vitolin', 'Novaja Programma Praktičeskogo Obučenija Agronomov v Sovhozahtehnikumah' (New Programme for the Practical Training of Agronomists on Sovkhoz-technikum), *Srednee Special'noe Obrazovanie* (Moscow), Vol. 13, No. 1, January 1966, p. 36–9.

The earlier comment regarding the U.S.S.R. applies also to the United States of America; no attempt will be made to describe the entire training system in the United States but a few typical examples will be given.

The first example concerns the training course for farm foremen organized by the local office of the Farm Labour Service under the Department of Employment, Palo Verde, California, in collaboration with the University of California, the Department of Education, private agricultural concerns, farmers' and growers' associations. The primary purpose of this course is to improve working conditions on farms, thus reducing labour turnover and increasing productivity. An experimental course (ten two-hour sessions, each followed by one to three hours of discussion) covered basic information on psychology, personnel management and human relations, communication processes, leadership, sociology and foremanship (a description of the job itself and the qualities it requires).

With a nucleus of trained instructors, training classes for farm foremen have since been arranged in rural areas throughout the State of California under the Adult Education Programme. Farm Labour Service representatives advise on the numbers of foremen requiring training in an area; the Department of Education and local school boards make the necessary practical arrangements. No special educational qualifications are required for admission. Course materials are free. At the end of the course, trainees receive a certificate.[2]

With regard to agricultural technicians, the Modesto Junior College, California, has undertaken a study on their work and the type of training. Most of the agricultural technicians who were interviewed considered that the major part of their training had been acquired on the job. The areas of agricultural training most frequently mentioned as essential in connexion with their work were as follows, listed in order of importance: agronomy and field crops (basic shop skills), supervision of agricultural personnel, soils, vegetable crops, agricultural processing, horticulture, agricultural business administration, irrigation, agricultural sales. The following were considered essential areas of basic training, other than agriculture: basic arithmetic, basic composition (reports and letters), bacteriology-parasitology, entomology, general biology, chemistry. Agricultural technicians as a group felt they needed upgrading on the job. The continuing changes in their respective fields necessitated further training to keep abreast of developments.[1] Another article in a American journal gives a detailed description of the contents of a training programme for agricultural technicians.[2]

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[1] V. Sakun', 'Školy Praktičeskogo Obučenija' (Practical Training Schools), *Kolkhozno-sovkhoznoe Proizvodstvo* (Moscow), No. 11, November 1963, p. 54–5.

[2] S. Eldon Cully, 'Training Farm Foremen', *Employment Service Review* (Washington, D.C.), Vol. 2, Nos. 1–2, January–February 1965, p. 12–13, 44.

Secondary sector

Much has been written on the training of different types of middle-level personnel in the secondary sector in the advanced countries. Therefore this section will be broken down into two subsections, one devoted to technicians and the other to supervisors. Each will be introduced by a brief summary largely based on the data collected together by CIRF publications (see *Training for Progress*, already referred to at the outset of this study [3]).

Training for adult technicians

In some countries (e.g. the U.S.S.R., other socialist countries, the Federal Republic of Germany and Switzerland), skilled worker training is considered a standard preliminary to technician training. But insistence on broad practical experience is also usual in other countries:

> It is generally accepted, then, that technicians need, and will continue to need, more and higher-level training because of the increasing complexity of the work they are being expected to perform. Differences of opinion appear mainly in whether the final objective is achieved through longer initial training, via course intensification or through continuing training after entry into employment.[4]

As regards the selection problem 'there is a decided and parallel trend towards more rigorous selection procedures and criteria'.[5] The status of technicians varies with the concepts of role and functions, with the recruitment basis, with the level and duration of their training and with the type of institution providing the training.

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1. LuVerne Donker, 'Learning on the Job Important to Agricultural Technicians', *The Agricultural Education Magazine* (Columbus, Ohio), Vol. 37, No. 2, August 1964, p. 29–30.
2. James E. Dougan, 'Let's Tool Up for Training Technicians in Agriculture', *The Agricultural Education Magazine* (Columbus, Ohio), Vol. 37, No. 1, July 1964, p. 12–13.
3. ILO/CIRF, 'Trends in Training 1961–1967 . . .', op. cit.
4. ibid., p. 59.
5. ibid.

> One of the chief methods by which recognition of technician status is sought, is through institution of a system of certification. ... Certification and formal recognition of titles, it is felt, could help bring about a measure of standardization and thus a basis for defining status.[1]

In conclusion, it may be said that technician training is still marked by trends that are difficult to reconcile. Thus recruitment through upgrading and training for promotion takes into account the need for extensive practical experience but cannot always be reconciled with a trend towards a higher level of initial theoretical training and, for this reason, has sometimes had detrimental effects on the technician concept and status. The efforts to integrate the different types of training in a unified system of certification and a uniform status should be pursued. On the other hand, the general move to raise the status of the technician and the more flexible approach to formal technical education with its resultant easier transition from one level to another bring with them 'the danger that technical training will be considered merely preliminary to higher education and not a training in its own right'.[2] A solution to some of the problems discussed here is sometimes sought in diversification, by instituting a three-level structure (junior, middle-level and senior technicians).

Examples from some of the advanced countries will illustrate and pinpoint the various current trends.

In France, promotion from the ranks, instituted as a system in 1959, is intended for adults and supplements the system of formal technical instruction that is, in principle, restricted to young people. The various industries are introducing promotion from the ranks in their respective fields. To this end the Fédération des Industries Mécaniques et Transformatrices des Métaux (FIMTM), for example, has set up a Conseil Pédagogique to supervise a vocational training and further training scheme whereby it should be possible to rise from apprentice to engineer. For transition from the level of skilled workman to technician, FIMTM has instituted courses leading to different levels of technician certificates. These courses last two years.[3]

In the chemical industry, apprentices and laboratory workers may attain the level of senior technician in chemistry after following appropriate courses. While working in industry, the laboratory assistant may prepare for the relevant certificate in industrial education (giving him the status of assistant chemist) by taking courses (evening courses in Paris or correspondence courses in the rest of France) organized by COPRIC (Cours de Formation Professionnelle des Industries de la

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1. ILO/CIRF, 'Trends in Training 1961–1967...', op. cit., p. 61.
2. ibid., p. 62.
3. François Peugeot *et al.*, 'De l'Apprenti à l'Ingénieur', *Les Industries Mécaniques* (Paris), Supplement to No. 459, January 1962, 80 p.

Chimie). The practical courses may be organized either on in-plant or, in the case of correspondence courses, on inter-plant basis. The examination is the same as that taken by pupils in the State technical secondary schools. Those who have completed three years of work in chemistry with an assistant chemist's certificate may sit for the certificate of senior technician in chemistry. This certificate too may be prepared by taking evening courses or correspondence courses through COPRIC.[1]

In the Federal Republic of Germany, the Permanent Conference of Ministers of Education (Kultusministerkonferenz) issued basic regulations for the training of technicians,[2] deferring until later the consideration of similar regulations for the qualifying examination.

The position adopted by the German Federation of Trade Unions (Deutscher Gewerkschaftsbund—DGB) in this connexion is interesting and clearly reveals what the situation was in 1965. The DGB considers that there should be comprehensive regulations governing training and certification matters. It attaches great importance to the institution of a formal examination which could be taken not only by candidates who had received full-time training in the technical colleges (*Fachschule*) or had taken one of the 'night school' courses provided for in the basic regulations but also by those who had received other forms of training, namely via correspondence courses or evening courses not run by the 'night schools'. Since there are only a limited number of vacancies in full-time colleges and 'night schools' it is inevitable that some of those wishing to prepare for a technician's post should be obliged to choose other methods. So it would be unjust to deny them the opportunity to take the qualifying examination. Furthermore, technical colleges are mainly located in industrial towns so that those living in the country are unfairly deprived of access to technician training. Therefore it would be advisable to examine the possibility of offering them a means of training by organizing State-approved correspondence courses. Three objectives should be kept in mind: standardization of subject-matter for each specialization; standardization of the length of correspondence courses; standardization—taking into account the regulations governing examinations in each *Land*—of the conditions for admission to an examination leading to a standard form of certificate.

The DGB is also concerned about the problems arising from admission to 'higher technician' (engineer) studies of 'technicians' who have completed the course of studies provided for in the basic regulations. In fact a barrier still separates these two levels. Although at present very few middle-level technicians enter for higher-level studies, it would be desirable to establish some procedure whereby the particularly gifted could do so without being forced to wait or to meet additional requirements relating to prior training.[1]

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[1] Jean Givaudon, 'La Promotion Sociale dans les Industries Chimiques', *Technique, Art, Science* (Paris), No. 181–2, September-October 1964, p. 56–60.

[2] See Chapter 4 above: 'Laws and Regulations Governing Middle-level Personnel'.

In the United Kingdom the organization of technician training is not yet entirely satisfactory, as is shown by the opinions and examples given below. The Iron and Steel Industry Training Board has formulated recommendations for the training of technicians and technologists. As a preliminary step the board sought to achieve an increase in the number of planned comprehensive schemes and an over-all improvement in quality up to that of the best existing schemes. In general terms, the board wishes to see: induction training, including familiarization with opportunities for training and further education; a systematic programme of practical training and experience to provide the basic knowledge and skill required for the first job after training; release for appropriate courses of further education.

Narrowly specialized training should be avoided. Within the separate categories a broad common training should be provided initially, which will facilitate later transfer to new jobs arising out of the changing needs of industry.

Before making grants under the Industrial Training Act, 1964, the board may require evidence that such specific programmes and syllabuses have been devised, and that competent individuals have been made responsible for carrying them out and for ensuring the maintenance of records of training progress. Smaller companies may have to establish co-operative training facilities or rely on outside establishments or the training facilities of other companies.

When designing syllabuses and programmes for practical training, companies will need to consider the sources and previous experience of recruits. The duration of practical training for technicians should be approximately four years, and for technologists two years, or in certain cases, even less. Practical training should be so designed as to enable theoretical and scientific principles to be related to the day-to-day practices in the industry. Provisions should be made for retraining and refresher courses in specific fields.[2]

In a book published in 1965, *Technicians Today and Tomorrow*, the results of technical training are deemed disappointing; most technicians receive their training from part-time courses under the Local Education Authorities; these authorities must realize that their responsibilities extend far beyond the local setting. Moreover, it is debatable whether the voluntary principle should continue to apply to this type of further education. There is reason to question whether, despite former successes, part-time education under the day-release system can achieve a standard comparable to that of foreign technicians. In the long run, full-time instruction (or its variant, the sandwich system) seems indeed to be the most reliable method for training technicians.[1]

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[1] Karl Günther, 'Probleme der Technikerausbildung' (Problems of Technician Training), *Berufliche Bildung* (Düsseldorf), No. 5, October 1965, p. 3–6.

[2] Iron and Steel Industry Training Board, *Recommendations for the Training of Technicians and Technologists*, London, 1966, 20 p.

Despite efforts made since enactment of the Industrial Training Act, the author of an article that appeared in 1968 still urged the need to rationalize the structure of technical education and of technician training programmes. In his view, the existing structure of further education for technician training is marked by a proliferation of courses bordering on disorder. Training programmes should take the following suggestions into account: (a) in considering course structure, due regard must be paid to the earlier phase of education in the schools; (b) the devious route to technician status—through craftsman training and a multiplicity of further education courses under the control of the local authorities—should be discontinued; (c) there seems to be no valid reason why there should be separate courses for each technology, with similar subjects but slightly differing syllabuses; (d) the qualifying examination system should comprise two types of examination—one for part-time, the other for full-time courses; these examinations would correspond to the Higher National Certificate (HNC) and the Higher National Diploma (HND) respectively.[2]

In the U.S.S.R., evening courses and correspondence courses play a major part in the training of adult technicians (in 1964, over half the total number of students enrolled in middle-level specialized schools were engaged in part-time studies while working in production sectors). This type of instruction is constantly being improved and adapted to the needs of workers and undertakings. To this end, in pursuance of an Order of the Council of Ministers, the State Planning Committee of the U.S.S.R. (GOSPLAN) and the Ministry of Higher and Specialized Secondary Education have, with the co-operation of various other authorities, introduced a series of measures designed to promote part-time studies:

Sections responsible for specialized instruction by correspondence and evening courses will be organized both within scientific research establishments and on the large State farms (*sovkhozy*).

In drawing up construction plans for large undertakings, provision will be made for the installation of laboratories, workshops and classrooms for part-time specialized courses.

The technical colleges and various other teaching institutions will organize in-plant orientation to prepare workers for these courses.

The State Committee for Press and Publishing will arrange for each student enrolled in a correspondence course to receive in time the

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1. J. T. Young, *Technicians Today and Tomorrow*, London, Pitman, 1965, 222 p.
2. J. Bell, 'Course and Examinations for Technicians', *Technical Education and Industrial Training* (London), Vol. 10, No. 8, August 1968, p. 327–9.

textbooks required for his studies and complete methodological documentation.

The State Committee for Radio and Television will arrange for the broadcast of programmes dealing with specialized education to assist part-time students with their individual work.

Undertakings will ensure that their workers who have taken such courses are transferred to posts with responsibilities in line with their higher qualifications.

The task of teaching the evening courses and directing the correspondence courses will be assigned to the most experienced teachers whose methods have proved effective in practice.[1]

Training of supervisors

An analysis of the CIRF Abstracts on this subject indicates that 'supervisory training, more than any other single sector of the training field, has been going through a period of assessment'. The common trend has been to look backwards at the product of past activities and policies—the multitude of supervisory training programmes—and to ask whether the latter are really fulfilling their purpose.[2]

Two major lines of supervisory training development are apparent. The first concerns the human factor in supervision and business enterprise: human relations, communication, economics, management theory, organization, staff relations, company goals, industrial safety and hygiene, worker training and development. The second relates to the technical training complex from basic arithmetic, physics and chemistry up to specific training in the different technical aspects of production. In brief, training in the latter field tends to follow conventional classroom methods. Instruction may be given during working hours or outside them, in the evenings or other spare time. Much more variety and imagination are evident in the training to prepare the supervisor for the human relations aspect of his functions. Methods such as

> role-playing, unstructured conferences, discussion groups and case study are all used in an effort to teach good human relations principles and techniques and leadership. . . . [What] is wanted in supervision are well-rounded people who not merely have a good technical grounding but also possess human relations skills. Over and above this they must have had a training that has been broad enough to make them adaptable to change.[3]

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[1] I. G. Zuev, 'O Dal'nejšem Ulučšenii Večernego i Zaočnogo Obrazovanija' (The Progressive Improvement of Teaching in Evening and Correspondence Courses), *Srednee Special'noe Obrazovanie* (Moscow), Vol. 11, No. 5, May 1964, p. 1–5.

[2] ILO/CIRF, 'Trends in Training 1961–1967 . . .', op. cit., p. 49.

[3] ibid., p. 53–4.

With regard to the organization of training, there are two main approaches:

> . . . through trial and error on the job, or in a classroom situation. Each method of approach has drawbacks: in the trial and error system 'the learning process will probably be long and the errors too expensive'; in the classroom 'the supervisor's mistakes will be less expensive, but it will be impossible to create artificially the pressures and the practical components of the work situation'. . . . There seems to be a consensus that there is need for broadly based training utilizing both approaches. . . . There seems also to be general agreement that, while main responsibility should rest with the firm, there are situations which demand off-the-job training outside the company.[1]

There are several examples of major industries setting up complex systems for supervisor training. As to the place of instruction, it is possible to distinguish between 'on-the-job instruction, secondment to other departments, off-the-job training within the company and off-the-job training outside the company'.[2]

A study to assess the results of supervisory training carried out in France provides a very good example of the general endeavour to assess effectiveness which we referred to above. At the request of the National Planning Commission, the French Association for Increased Productivity (AFAP) has attempted, by using measurement techniques based on statistics and social psychology (with clinical analysis), to check some of the hypotheses on which modern training methods for supervisory staff appear to be grounded.

Three major fields were explored in this connexion: the individual changes in the attitudes of supervisors after undergoing training; the occupational career of the supervisors trained; the relation between the characteristics of the firm and the effects of training.

An important finding soon emerged; one and the same form of training, namely that provided for supervisors from different undertakings by seven regional supervisory training schools having an identical syllabus and all using the active method (lectures, discussion groups, case study, role-playing, films, visits to factories), led to different results, depending on the conditions prevailing in each undertaking. These differences could be ascribed to five main factors: (a) the pace of technical change necessary for the product to maintain its position on the market (supervisory training is more easily integrated into the structure of an undertaking where technical changes are being introduced); (b) prevailing economic climate (during a recession an undertaking is likely to put a brake on any initiatives in this field); (c) the size of the undertaking (in small firms the supervisor is often the only intermediary between the workers and the head of the undertaking, with consequently more influence, whereas in a large firm management personnel are inclined to resent the 'encroachments' of trained supervisory personnel); (d) the conscious or unconscious aims which lay behind the management's decision to train supervisors (these have a marked influence on the orientation of the training and its subsequent application); (e) the attitude of management personnel towards a change, depending on whether or not they themselves attend further training courses.

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[1] ILO/CIRF, 'Trends in Training 1961–1967. . .', op. cit., p. 55.

[2] ibid.

Consequently, regardless of the training methods employed, the effectiveness of supervisory training depends above all on the way in which it fits in with the economic, technical and psychosociological structure of the undertaking. It also depends on how it is viewed, individually and collectively, in the various echelons as well as on the degree of mutual trust and confidence on the part of those concerned, to the establishment of which it can even contribute by introducing a less formal, more relaxed relationship between the members of the group.[1]

It is perhaps in the United Kingdom more than in any other country that supervisory training has been the subject of innovations, discussion and controversy over the last few years. The Ministry of Labour appointed a Committee on the Selection and Training of Supervisors, which published its first report in 1962, containing various recommendations in this field. The committee subsequently reviewed the progress made and presented some new proposals, the principal being as follows: all bodies concerned should co-operate to secure top-management interest in supervisory training; research into the evaluation of training should be promoted; a survey of the attitudes of employers who do not train their supervisors should be conducted; there should be more experimentation with different types of training courses; job analysis of supervisory posts should become common practice; undertakings might co-operate in certain aspects of supervisory training.[2]

In 1965, the National Examinations Board in Supervisory Studies (NEBSS), appointed in 1964, put forward some proposals concerning new certificate requirements for supervisors. The NEBSS proposed that a general certificate in supervisory studies be awarded to candidates who completed a course of studies and passed the relevant examinations, provided the course: had been run according to an NEBSS syllabus and had led to an external examination, set and assessed by the board; was an approved course established by a college on the basis of the NEBSS syllabus and culminating in internal examinations assessed by NEBSS-

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1. F. Gauchet, Robert Meignez, Simone Nodiot *et al.*, 'Evaluation des Résultats d'une formation d'Agents de Maîtrise', *Interproductivité* (Paris), supplement to No. 144 of 1 January 1967, 24 p.
2. Great Britain, Ministry of Labour, *Selection and Training of Supervisors—Progress Report*, London, HMSO, 1964, 30 p.

appointed assessors; or was an independent course run by an approved college.

The proposed NEBSS syllabus consisted of 240 hours of instruction. It comprised five sections: principles and practice of supervision; industrial relations; technical aspects (work organization and planning, methods study, job evaluation, techniques of assessing and controlling work); economic and financial aspects (the national economy, profit and loss accounts and balance sheets, elements of costing, budgeting and estimating communications).

The NEBSS recommended that the 240-hour course be given over a twelve-month period, preferably through day releases. It it were to be given in evening classes, the period would have to be extended to eighteen months or longer. These NEBSS proposals were not to be considered a rigid framework. Local or special requirements should be taken into account.[1]

The NEBSS approach came under fire from specialists in supervisory training. In their view, the 'general principles' included in the training programme proposed by the NEBSS are rather superficial and it is hard to see how they can be taught in such a way as to be of real use to the supervisor on the job. General basic education seems much less important to the future supervisor than in-plant training geared to a particular job. Furthermore, there is no obvious reason why a particular level of general education should be required of candidates for a supervisory post. What is needed is a system enabling supervisors who have become efficient in their particular job to attend general educational courses which will allow them to improve their knowledge if they so desire.[2] These specialists believe that the real priorities of supervisory training lie elsewhere. The NEBSS approach, like the supervisory training programme proposed by the Engineering Industry Training Board (EITB), is still rather conventional: it is based on the principle that supervisors should be trained with a view to acquiring certain skills and enough knowledge to apply them.

Research has shown, however, that supervisors are usually struggling with a wide variety of contingencies: problems caused by gaps or failures in the control system or the planning mechanisms of management. If conditions were predictable, supervisors could be trained to deal with a set of defined situations, their responses could be foreseen, and procedures be laid down to help them. This is not generally the case. It is clear that a supervisor in an actual work situation is following a 'strategy of action' in dealing with the many problems that arise. The important point, however, is that such strategies are usually learnt implicitly on the job.

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[1] J. J. Henderson, 'Looking Ahead in Supervisory Education', *Supervisor* (Birmingham), Vol. 16, No. 9, September 1965, p. 2–7.

[2] K. E. Thurley and A. C. Hamblin, 'The NEBSS Approach', *Industrial Training International* (London), Vol. 2, No. 2, February 1967, p. 68–71.

Although it is conventional training practice to express all training needs in terms of knowledge, skills and attitudes, these are difficult to relate to the actual behaviour required. The crux of the problem of meeting supervisory training needs is to develop the correct 'response' by the supervisors to the contingencies they should be dealing with. As most of these are unforeseen it is likely that the exact situation in which the foreman has to act is also unforeseen. This is why much supervisory training, although groping after 'real' problems, is often felt by supervisors to be conducted at an 'unrealistic' level of meaning.

An alternative approach is suggested whereby the emphasis will be on helping the supervisor find and devise realistic and efficient strategies to deal with his problems. From this approach it is possible to draw some tentative guidelines for supervisory training:

It is important to start from job problems or potential problems.

The training programme should involve supervisors (at various levels) and those managers, whether in line or staff departments, who are directly involved with shop-floor problems.

There is a basic need for participants in the programme to help in defining the training objectives.

The methods used in this approach to training are likely to include a mixture of on-the-job discussions about problems between managers and supervisors, off-the-job group discussions and studies of job problems by third parties (the information obtained being fed back to the groups for discussion).

Training of this type is not to be seen as a once-for-all exercise, but as a normal and continuous activity for dealing with work problems.

Training needs cannot be met all at the same time: it is necessary to proceed step by step, starting with the most urgent priorities.[1]

The authors subscribing to this view question the very substance of the 1964 Industrial Training Act as far as supervisory training is concerned. The levy-grant system is in danger of creating such effective incentives for adopting a training board's recommendations that it can easily outweigh the consideration that appropriate training needs to be based on the 'local' judgement of supervisors and managements. These authors propose the creation of a central advisory body, a Central Supervisory Education Council, to co-ordinate efforts in regard to supervisory training. Its task would be to develop teaching methods likely to be acceptable to supervisors and to apply them to a range of courses.[2]

The two following supervisory training school programmes are typical of the type of training given in Eastern Europe.

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[1] K. E. Thurley and A. C. Hamblin, 'The Real Priorities', *Industrial Training International* (London), Vol. 2, No. 4, April 1967, p. 154–7.

[2] K. E. Thurley and A. C. Hamblin, 'A Programme of Action', *Industrial Training International* (London), Vol. 2, No. 5, May 1967, p. 202–6.

The technical schools for supervisors set up by the factories in Dnepropetrovsk (Ukrainian Soviet Socialist Republic) operate with the backing of these undertakings' training sections. Those attending are divided into groups based on related trades. The instruction is designed for two levels of general education: (a) workers who have completed five or six years of schooling are brought up to eighth year primary school level; (b) those who have completed seven or eight years of schooling are brought up to secondary school-leaving certificate level.

The courses last three years. During the first two years general education is provided. The third year is given over to general technical subjects and special subjects. On completion of their course, trainees receive a certificate subject to their passing an examination and a practical test.[1]

Growing numbers of these evening schools for supervisors have also been set up in the Ural industrial region by the iron-and-steel industry and engineering works. The programme includes 1,404 hours for general education, 540 hours for technical and trade subjects, of which two-thirds are spent on trade theory, the remainder being divided between technology, technical drawing, work organization and economic aspects of production. In addition, students have a total of 216 hours for regular tutorials or consultations. Since the courses are usually for older workers who have long since left school, classes should comprise no more than twenty to twenty-five students.[2]

Later, schools for supervisors were set up throughout the territory of the Russian Federation, and also in Kazakhstan and the Baltic republics. Experience has shown that for these evening schools to operate smoothly (three-year courses, twenty hours per week) it is advisable to confine enrolment to highly skilled workers and foremen, namely those who have come up from the ranks without any specific training. Subject to certain age limitations, students should be grouped in classes organized on the basis of related trades, though some may have to receive some preliminary additional general education in order to bring them up to the level of the others.

These schools are at present the subject of experimental teaching research, carried out by the Socio-pedagogical Laboratory for Schools for Supervisors.[3]

In the United States, research has shown that supervisors are still frequently promoted from the ranks of the workers without receiving any proper training, which gives rise to a number of problems. The greatest

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1. V. Ulasevič, 'Tehničeskie Školy Masterov' (Technical Schools for Supervisors). *Profes-sional'no-tehničeskoe Obrazovanie* (Moscow), Vol. 20, No. 2, February 1963, p. 27.
2. I. G. Zuev, 'Škola Masterov—Važnaja Forma Obučenija i Vospitanija Rabočih Kadrov' (Schools for Supervisors—an Important Means of Training and Education for Qualified Personnel), *Večernjaja Srednjaja Škola* (Moscow), Vol. 8, No. 3, May-June 1965, p. 19-25.
3. I. G. Zuev, 'Školy Masterov—Eto Progressivno!' (Schools for Supervisors—a Force for Progress), *Narodnoe Obrazovanie* (Moscow), No. 2, February 1967, p. 69-74.

difficulty encountered by the supervisor in adjusting to his new job is his lack of understanding of the responsibilities he has to assume. It has also frequently been observed that the greatest feeling of pressure stems from friction between supervisors and line managers, such as inspectors or engineers. In the light of the results obtained in this research—which was carried out in nineteen factories in Wisconsin ranging in size from 148 to 18,000 employees (each supervisor being responsible for between five and sixty employees)—the following recommendations were made:

The supervisor should be well briefed on his job and told why he was selected. He needs to know how he and his department relate to staff functions and other departments.

Much wider use should be made of pre-supervisory training programmes covering management principles and theory, management responsibilities of the supervisor and an introduction to the firm's organization, the union contract, etc.

Well-defined avenues of communication should be established.

Performance standards should be established and communicated to the new supervisor, so that he can appraise his own performance and progress.[1]

An evaluation of the Colorado Public Service Company's supervisor training programme has led to its extension in the form of supervisor development seminars. Each seminar is made up of monthly two-hour discussion sessions arranged over eight months. To be eligible, supervisors must first have completed a standard fifty-four-hour course in 'Basics of Supervision'. Participation is limited to groups of eighteen supervisors. Group leaders must be carefully selected. Far from dominating the group, they must know how to help it find its own answers. After some initial training in conference leadership, the group leader spends one year as an assistant conference leader, i.e. an observer who remains silent but notes down the progress of the discussion. A monthly publication containing a record of these discussions and the conclusions of all the groups is distributed to all supervisors.[2]

Another article that appeared in the United States listed the different methods for training supervisors—methods related to one or other of the two major schools of thought mentioned earlier: by trial and error or in a classroom situation. There is an enormous variety of training programmes and courses designed for potential or serving supervisors: pre-training, varying between three days and sixteen weeks; temporary assignment of line workers to supervisory jobs, under instruction; courses run by outside agencies, lasting one to two years (comprising courses or group discussion meetings held outside working hours and usually paid for by the undertaking); coach-and-pupil method of training on the job—the foreman gradually trains his successor to take over; crash programmes for accelerated training (for example ten hours' intensive instruction in company policy, administration, labour relations, etc.); short intensive courses on specific subjects, such as cost control, a technical innovation, time-study, etc. [1]

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[1] Bradford B. Boyd, 'Worker to Supervisor—Problems of Transition', *Personnel Journal* (Swarthmore, Pa.), Vol. 43, No. 8, September 1964, p. 421–6.

[2] E. P. Mills, 'Supervisor Development Seminars; A Continuing Program for Supervisor Training', *Training Directors' Journal* (Madison, Wis.), Vol. 18, No. 10, October 1964, p. 45–50.

One reason why, contrary to current practice in other countries, there is practically no mention in the United States of general education in the training programmes for supervisors is no doubt to be found in the current trend to recruit university graduates for these posts. This trend is particularly noticeable in growth industries and in those (such as electronics) where automation is replacing traditional methods and techniques. Undertakings that have already introduced this policy contend that graduate supervisors are more versatile than non-graduates. Where it forms part of an integrated policy, the parallel employment of graduates and non-graduates as supervisors provides a variety of talents which interact extremely well. Any undertaking that decides to employ university graduates as supervisors must do so in accordance with a planned personnel policy which includes graduate supervisors as a recruitment pool for management.[2] Several publications that have appeared in the United States give some idea of the range of methods applied to training middle management:

AMERICAN MANAGEMENT ASSOCIATION. *Programmed instruction for management education.* New York, N.Y., 1963–64. 4 vols.

——. Making the most of training opportunities. *AMA—Management bulletin* (New York, N.Y.), no. 73, 1965, 46 p.

GORDON, D. E. Appraising training needs—a new technique for management. *Personnel journal* (Swarthmore, Pa.), vol. 44, no. 7, July-August 1965, p. 349–353. (Method of self-assessment used by supervisors to pinpoint their own training needs.)

NEVIS, E. C.; SMITH, A.; HARPER, R. L. Behavior and attitude changes related to laboratory training. *Training directors' journal* (Madison, Wis.), vol. 19, no. 2, February 1965, p. 3–7.

POTTER, C. J.; STRACHAN, G. D. Project training groups—a demand technique for middle managers. *Training directors' journal* (Madison, Wis.), vol. 19, no. 9, September 1965, p. 34–40.

UNDERWOOD, W. J. Evaluation of laboratory-method training. *Training directors' journal* (Madison, Wis.), vol. 19, no. 5, May 1965, p. 34-40. (Assessment of the change in attitude, particularly in regard to human relations, on the part of supervisors who have undergone sensibility training.)

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[1] I. G. Zuev, 'Man in the Middle', *American Machinist* (New York), Vol. III, No. 13, 19 June 1967, p. 101–42.

[2] I. G. Zuev, 'Are College Graduates Better Foremen?', op. cit.

VALENTINE, R. F. *The appraisal interview.* New York, N.Y., American Management Association, 1964. 40 p. + LP record. (Method to develop the skills and labour productivity of supervisors and managers.)

The tertiary sector

This section will be short and will only deal with two questions by way of examples: the recent establishment (or proposed establishment) of suitable structures for training middle-level business personnel, and the training and further training of the technicians or engineers responsible for technical services in United Kingdom hospitals. It is well known that many undertakings and public services have for a long time been arranging for the training and further training of their middle-level personnel. In many advanced countries this type of training is supported by professional associations. In some cases examinations are held and diplomas conferred on completion of training.

In the Federal Republic of Germany, the basic training intended in principle to fill middle-level posts in business or the civil service is provided by the higher commercial schools (*höhere Handelsschulen*), secondary-level establishments that provide a one- to two-year course. This type of instruction has been supplemented since the early 1960s by the commercial colleges (*höhere Wirtschaftsfachschulen*), which offer a secondary-level education for those whose schooling was interrupted after the primary stage. The purpose of this type of school is to provide supplementary instruction on a scientific and systematic basis to promising young business employees who are liable to be promoted to the ranks of middle management. The syllabus stresses three aspects:

Half the syllabus is devoted to general business instruction in the following subjects: business administration, calculus, statistics, finance, mathematics, rudiments of economics, law and sociology.

One quarter is devoted to specialization in two of the following: industrial management; business theory and marketing; international trade combined with foreign languages; organization; personnel management and training.

The remaining quarter is taken up by general education, covering economic and social history, economic geography, civics, German and English.

The course lasts two and a half years. Students are expected to spend their holidays on practical training in the field of their specialization. Before being admitted to the course students must have done their statutory trade apprenticeship and have a minimum of one year's practical experience; this also helps to maintain a balance between theory and practice.

At the end of the third semester students take a preliminary examination, and a final examination after five semesters. These two examinations are subject to government-approved regulations. Successful candidates are awarded a certificate and the title of *Betriebswirt (HWF)* (middle-level business manager).[1]

In Switzerland, discussions are at present under way regarding the creation of a similar type of school for middle-level management.

In the Federal Republic of Germany, it has also been proposed to introduce the system of training by stages *(Stufenausbildung)* in vocational training for business and the civil service. This system, which originated in industry, divides training into several stages, each of which is complete in itself and allows the trainee to pass on to the next stage, for example, in the case of late development or of adults who are already working and wish for further training. The principle underlying training by stages is selection according to ability, giving all alike a fair chance to receive suitable training.

In the proposed system, training in the civil service and business would be in four stages, the fourth being for the further training of adults with a view to promotion to middle-management posts.[2]

The last example, relating to a specialized category of middle-level personnel, deals with the qualifications and training of hospital engineers in the United Kingdom. A study group appointed by the Ministry of Health published a report on this subject in 1962. Modern hospital engineering requires a high degree of technical and managerial knowledge and skill. The hospital engineer maintains and keeps in running order the very costly and complex installations; he is responsible for the services and equipment essential to the application of medical science; he also co-operates with the hospital staff in the development of apparatus and techniques.

The study group recommended that all engineers recruited from outside should be given specialized training in hospital equipment, procedures and techniques. Study leave and financial assistance for training should be re-examined and the facilities available for the purpose should be made known to all present and potential hospital engineers. Refresher courses and conferences and visits to manufacturers of special hospital plant and equipment should be arranged.[3]

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[1] I. G. Zuev, 'Zum Entwurf eines Bildungsprogrammes' (Blueprint for a Training Programme), *Wirtschaft und Erziehung* (Wolfenbüttel), Vol. 17, No. 6, June 1965, p. 1–25; Konrad Nüsse, 'Staatliche Höhere Wirtschaftsfachschulen in Nordrhein-Westfalen' (State Commercial Colleges in North Rhine-Westphalia), *Wirtschaft und Erziehung* (Hannover-Waldheim), Vol. 14, No. 4, April 1962, p. 149–55.

[2] G. P. Bunk, 'Kaufmännische Berufsausbildung in Mehreren Stufen' (Training by Stages for the Civil Service and Business), *Information über das Berufliche Bildungswesen* (Düsseldorf), Vol. 15, No. 12, December 1964, p. 6–8.

[3] Great Britain, Ministry of Health, *Report of the Study Group on the Work, Grading and Qualifications of Hospital Engineers*, London, 1962, 21 p.

Chapter 6

The relationship between vocational training and general education for middle-level personnel

Introduction

A number of reasons make it difficult to distinguish clearly between vocational training and general education.

At the most elementary, commonsense level, we may attempt to classify the knowledge, aptitude and experience[1] which training provides according to their professional and non-professional 'usefulness', in the following manner:

1. Skills which are 'useful' at the professional but not at the non-professional level, e.g. teaching designed to familiarize departmental supervisors with a type of machine newly introduced into their department.
2. Skills which are 'useful' at both the professional and non-professional levels, e.g. teaching designed to familiarize supervisors with certain aspects of psychology or to develop their capacity for oral or written self-expression.
3. Skills which are professionally 'useless', but which are 'useful' at the non-professional level, e.g. an educational course in the history of art attended by a supervisor in an industrial enterprise.[2]

According to this classification, skills of type 1 clearly fall within the scope of vocational training, those of type 3 come under general education and those of type 2 are covered by both vocational training and general education.

We may, however, refuse to accept without questioning the distinction on which this classification is based. The underlying assumption now is that the individual may be considered as a whole, differentiation between his professional and non-professional functions being virtually impossible. Seen in this light, the distinction between vocational training and general education loses much of its significance. Experience and—to a lesser extent—aptitude and knowledge are by and large considered as transferable from one field of activity to the other. Thus, a course of education in the history of art followed by a supervisor may be of service to him professionally, just as training designed to familiarize him with a new type of machine may be beneficial outside his occupation. The validity of this assumption will have to be investigated (it should be said here that, as will emerge later in this chapter, the results obtained in certain studies appear to confirm the professional 'usefulness' of a high level of general education).

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[1] To be referred to from now on by the collective term 'skills'.

[2] The notion of skills which are 'useless' at both levels need not concern us here.

Further light may be thrown on the relationship between vocational training and general education by distinguishing between the aims of training. Training policy may be defined as 'utilitarian' if it is concerned merely with the development of skills which are professionally 'useful'; it may be defined as 'global' if its aim is the over-all development of the individual.

A combination of this distinction with the two earlier definitions enables us to classify training policies in the following manner:

1. Primarily utilitarian policy exclusively concerned with vocational training.
2. Primarily global policy involving both vocational and general training or education.
3. and 4. Utilitarian and global policies which have different objectives but which employ similar means, each being concerned with both vocational training and general training. Here, the apparent contradiction between vocational and general training disappears.

This classification may help us to clarify the problem at the theoretical level. In practice, however, the four types of training policy sometimes merge with each other, in so far as their objectives frequently lack precision, as does the distinction between the policies defined in 1 and 2 and those defined in 3 and 4.

Unesco appears to favour policies of the latter type, judging from the following statement:

> The training of personnel is a prerequisite of the social progress which is desired by many sections of the populations and which many countries have included in their legislation and development programmes. Intensive training and regular 'in-service training' for those sections of the population that have already received a sound primary education qualifying them for the responsibilities of middle-grade personnel in the various sectors of national life is therefore one of the main objectives of lifelong education in the different societies. ... Theory and experience, particularly at polyvalent adult education institutions, combine to emphasize the importance of general training in a project of this kind, as both a basis and a consequence of all specialized educational activities. Only a general form of training aimed at developing the general capacities for perception, assimilation, reflection and expression, in

> accordance with curricula and methods specially adapted to these purposes, meets this fundamental requirement.[1]

This is very much in line with the view expressed by Torsten Husén in an OECD report:

> General education and vocational training will be more and more interwoven, simply because it will not be possible to predict what specific vocational attainments will be needed in the future. Paradoxically, general education (in the form of a 'basic repertoire' of fundamental skills and knowledge) will be the best kind of vocational training.[2]

This is also the official position in Sweden, where, as part of the labour market training programme, experiments were carried out in 1970 in providing courses in selected general subjects.[3]

Characteristics required of middle-level personnel

Middle-level personnel of certain types (supervisors particularly, but also activities promoters, extension workers and technicians) are increasingly required to display skills acquired as a result not only of vocational training but also of general education: a lively interest in facts; the power of analytical and objective observation; creativity; open-mindedness; appreciation of points of view other than their own;[4] the ability to express themselves and to communicate ideas; dexterity in human relations; and a sufficiently broad educational background to adjust to new situations.[5]

Importance of a high level of general education for midde-levell personnel

Various authors have stressed the importance of a high level of general education for middle-level personnel. As far as technicians are concerned, the Commonwealth Education Liaison Committee believes that every training course should include not only instruction in the theory needed for a proper understanding of the techniques to be mastered, together with experimental and laboratory work, but also practical instruction enabling the technician to acquire the necessary skills, humanistic studies and general education mainly concerned with written and oral communication.[1]

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[1] *Approved Programme and Budget for 1969–1970*, see Project 1.321.1, 'Assistance to Member States in the Training of Middle-grade Personnel', p. 126, Paris, January 1969, 564 p. (doc. Unesco 15C/5).

[2] T. Husén, 'The Purposes of Futurologic Studies in Education', in: OECD/Committee for Scientific and Technical Personnel, *Conference on Policies for Educational Growth*. Background study 12: *Alternative Educational Futures in the United States and Europe: Methods, Issues and Policy Relevance*, Paris, OECD, 158 p. (STP (70) 17).

[3] See: Sweden, Ministry of Education, *Press Communiqué*, p. 1, Stockholm, 18 March 1970, 3 p. (mimeo.).

[4] See, for example, Martinoli, 'I Quadri Tecnici ...', op. cit.

[5] See, for example: ILO/CIRF, 'Trends in Training 1961-1967 ...', op. cit.

On the subject of lifelong training for technicians, Jackson stresses that the question is not merely one of preserving a standard of competence in a given speciality, but also of improving knowledge of the economic, sociological and psychological factors on which the success of the industrial enterprise depends. The implication is that universities and colleges of further education must renew their efforts in a field of education still relatively new to them. There must be a new awareness of the interdependence and balance linking different academic disciplines, and different professions, and of the possibilities for interpenetration.[2]

In more general terms, Suchodolski examines the relationship between technical and cultural education. A brief historical survey shows that Greek civilization set as the basic ideal of education a combination of cultural values and technical skills. This ideal suffered an eclipse at the beginning of the nineteenth century, when a choice had to be made between the pursuit of cultural values and the development of technical skill. Now it is once again generally admitted that cultural and technical values are not incompatible. Technology demands an ever greater understanding of social co-operation and a clearer definition of the forms and structure of society and of their repercussions on the human individual. Scientific training is increasingly geared to the development of creative skills. Moreover, the intelligent use of an increasing amount of leisure by an increasing number of individuals depends primarily on the cultural level of the individuals themselves. What is called for is therefore a complete overhaul of the dualism which drew a hard-and-fast line between the schools dispensing culture and those providing technical education.[3]

Not all experts and educationalists are, however, agreed on the need for a high level of general education for middle-level personnel. Thus, for Thurley and Hamblin, United Kingdom specialists in supervisor training, a basic general education would appear to be far less essential to the future supervisor than on-the-job training designed to fit him for a particular task. Furthermore, these authors do not consider that a specific general educational background should be required of candidates for supervisory posts, believing rather that what is required is a means of providing supervisors of proven efficiency with the opportunity of following, if they so desire, courses of education designed to improve their general knowledge.[1] A study carried out in the U.S.S.R.[2] reveals the importance attached by overseers and shop-foremen in a Moscow factory to the general educational standard of the workers in their charge. Replies to the request 'List in order of importance what you consider to be the major qualifications to be required of candidates for posts' showed that age, practical experience, previous specialized training and even military service were given priority over the general level of education. In reply to the question 'What do you consider to be an adequate level of education for performance of the tasks in the workshop?', only 7 per cent of the supervisory staff consulted favoured the highest level (ten years of schooling); the remainder considered eight or even seven years to be adequate.

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[1] Commonwealth Education Liaison Committee, *Education and Training of Technicians*, op. cit.

[2] W. Jackson, *Manpower for Engineering and Technology*, London, British Association for Commercial and Industrial Education (BACIE), January 1970, 14 p.

[3] B. Suchodolski, 'The Balance between Cultural and Technical Education', in: *The Economics of Education*, London, Macmillan, 1966, 782 p. (proceedings of a conference held by the International Economic Association).

In practice, general culture is accorded varying degrees of importance in training programmes for middle-level personnel. Our investigations have shown, for example, that evening schools for supervisors in the Soviet Union devote almost three-quarters of their curriculum to subjects of a general cultural nature,[3] whilst the commercial schools of the Federal Republic of Germany which train young people for middle-level posts devote approximately 25 per cent of the time to such subjects (economic and social history, the geography of economics, civics, German and foreign languages).[4]

General education as a factor of adaptability

The most advanced industries in those countries which are in the vanguard of economic progress tend to recruit their supervisory personnel from among university graduates.[5] This tendency is based on the finding that such graduates, whose level of general education is high, are more adaptable than middle-level personnel promoted from below, and possess qualities rarely found in supervisors promoted from the shop floor: they are more responsive to change, and welcome training as a path to promotion; the scope of their knowledge, enhanced by practical experience, makes them adaptable and capable of performing a variety of tasks—a factor of particular value during periods when production is being cut back; lastly, being more self-reliant, graduates are less inclined to accept ill-considered instructions blindly and are thus more efficient.[1]

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[1] Thurley and Hamblin, 'The NEBBS Approach', op. cit.

[2] V. Nemčenko, G. Sinakova, L. Belkina, R. Govorova, R. Kolosova and J. Sysoev, 'Obrazovanie i Professija: Vsegda li Sojuzniki?' (Education and Occupation: Are They Always Allies?), *Literaturnaja Gazeta* (Moscow), Vol. 40, No. 27, 3 July 1968, p. 10.

[3] I. G. Zuev, 'Škola Masterov—Važnaja Forma Obučenija i Vospitanija Kabočih Kadrov', op. cit.

[4] I. G. Zuev, 'Zum Entwurf eines Bildungsprogrammes', op. cit.

[5] See above, Chapter 5, page 121.

Research in the U.S.S.R. concerning training for associated trades has revealed the following relationship between the acquisition of those trades and the trainees' level of general education: trainees who have reached any one grade, i.e. completed any particular year out of the six to ten years of general education, will on average need 50 per cent less time than those who have reached the next lower grade for assimilation of the knowledge and skills required for the trades concerned.[2]

In a technologically advanced world, where the rapidity of technical development makes a cardinal virtue of adaptability, general education is seen increasingly as a prerequisite of all valid technical education, facilitating as it does the assimilation of polyvalent technical training.[3]

General education as a factor of productivity

The hypothesis that a high level of general education has a favourable influence on productivity is borne out by a number of studies.

In the U.S.S.R., a comparative study was carried out with two groups of trained machine-tool operators; the only difference between the two groups was that members of the first had received the equivalent of ten years' schooling and those of the second, eight years.

Working in the same factory, the former regularly exceeded the monthly production plan by 20 to 30 per cent, whilst the latter had difficulty in reaching 90 per cent of the planned output. Analysis of the work done revealed that members of the second group spent up to 30 per cent of their time in interpreting the technical drawings and instructions relating to their tasks, the time taken for this purpose by their better-educated colleagues being extremely short.[4] Similarly, workers with eight years of schooling were shown to perform at a rhythm which exceeded by 35 per cent that of colleagues who had spent only five years at school. We may thus draw the general conclusion that the rate of output increases in proportion to the level of general education.

The same study threw light on the relationship between the contribution made by workers towards a rationalization of the production process and their level of general education. It was shown that only one

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1. 'Are College Graduates Better Foremen?', op. cit.
2. I. Kaplan, 'Kak Zavisit Proisvoditel'nost' Truda ot Urovnja Znanij?' (How does Productivity Depend on the Level of Knowledge?), *Škola i Proizvodstvo* (Moscow), Vol. 11, No. 2, February 1967, p. 60-2.
3. See, for example, A. Page, 'Desirable Balance between General Education and Technical and Vocational Training', in: *The Economics of Education*, op. cit.; cf. Chapter 18, p. 497–515.
4. A. Ahapkin, 'Čtoby Molodež' Učilas'' (So That Young People May Study), *Narodnoe Obrazovanie* (Moscow), No. 9, September 1967, p. 12–14.

in twenty of those with five or six years of schooling had made some contribution in this respect as compared to one in four of those with the equivalent of ten years of general education.[1]

The influence of the level of training on productivity also formed the subject of a survey carried out in Yugoslavia. This particular survey related to all types of qualified personnel, from highly skilled workers to top management. The survey covered thirty firms selected at random whose basic structure had varied very little between 1959 and 1963: there had been no new investment and the production process had undergone little alteration or reorganization. The only factors which could have varied were the level of training of the qualified personnel and, as a result, productivity.

Analysis of the observations showed, predictably, that in 50 per cent of the cases a higher level of training (recruitment of a larger number of highly qualified workers, increase in the number of qualified personnel with a complete school education, further in-service training for existing personnel) had resulted in increased productivity and that in 10 per cent of the cases a lower level of training had led to a drop in productivity. Less predictably, a lower level of training was accompanied by increased productivity in 20 per cent of the cases, and in another 20 per cent of the cases a higher level of training had gone with reduced productivity.

The relationship between general education and vocational training in the 'training' to which the study refers is not made clear, but the fact that only that training which is provided in schools was taken into account is indicative of the importance of general education. The study therefore indicates that while the level of training of qualified personnel may influence productivity, a raising of this level is neither the sole prerequisite nor even one of the prerequisites of increased productivity (the latter depending rather on practical experience and on the wisdom with which qualified personnel are distributed throughout the enterprise).[2]

General education as an aid to promotion

The very plausible hypothesis that a high level of general education is an aid to professional advancement has been verified by empirical research. Thus a survey carried out in Leningrad in enterprises employing workers who received their vocational training (theoretical and practical) in schools which also provided (senior) secondary education shows that out of 200 workers engaged in two of these enterprises immediately upon leaving school in 1962, 63 per cent had risen to higher posts by 1966, while only 44 per cent of 376 workers in the same enterprises who had received vocational training with no (senior) secondary general education had been promoted during the same period.[1]

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[1] Kaplan, op. cit.

[2] S. Mozina, 'Obrazovna Struktura Kadrova i Njihov Uticaj na Produktivnost' (Effect of the Level of Training of Qualified Personnel on Productivity), *Produktivnost* (Beograd), Vol. 7, No. 11, November 1965, p. 672–5.

Research done at the Laboratory for Economic Problems connected with National Education attached to the Moscow Pedagogical Institute confirms the importance of a high level of general education as a factor in promotion. It has been shown that the promotion of machine-tool operators to a higher grade takes an average of five years if they have had five or six years of general education, two or three years if they have had eight years of general education, and only one year if they have had ten. Similarly, machine-tool operators with general education to (senior) secondary level are promoted three times more rapidly than colleagues who have spent only five or six years at school.[2]

A high level of general education, coupled with practical supervisory experience providing first-hand knowledge of the problems of the enterprise, is also considered a path to promotion in the case of college graduate foremen in the United States of America; it is, however, essential to keep a proper balance between the number of graduate foremen employed and actual opportunities of advancement if disappointments are to be avoided.[3]

This leads us to the observation that a high level of education can give rise to conflicts in situations where the educational level and possibilities of promotion are out of balance. Proof of this is provided by a survey carried out in the U.S.S.R., which concludes that whilst a raising of their level of culture awakens in young people a particularly keen desire for advancement, the production system itself is not yet in a position to employ a highly educated work force.[4]

General education as a factor conducive to orientation

It is generally recognized that general education is an aid to orientation in a given environment. To cite only one example, the participants at a conference on management training in Africa have requested that training programmes include lectures and discussions on economic and social matters of general interest, so that middle-level personnel may be able to view their enterprises in relation to the economy as a whole as well as in relation to the sector to which they belong.[5]

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[1] A. G. Sokolov, 'Vozmožnosti Soedinenija Obščego i Professional'no-tehničeskogo Obrazovanija' (Possibilities of Linking General Education with Vocational Training), *Sovetskaja Pedagogika* (Moscow), Vol. 23, No. 3, March 1969, p. 39–46.

[2] Kaplan, op. cit.

[3] 'Are College Graduates Better Foremen?', op. cit.

[4] Nemčenko *et al.*, op. cit.

[5] *Technical Expert Meeting on Development of Managerial and Entrepreneurial Resources in Africa*, . . ., op. cit.

General education as a prerequisite for middle-level personnel promoted without special training

It has been pointed out elsewhere in this study that for economic reasons workers are often promoted to middle-level posts without having the necessary level of training (vocational training and general education). Thus, the authors of an Italian study have shown that a steadily increasing number of middle-level posts are filled by personnel who are entrusted with tasks and responsibilities for which they have not been trained.[1] In the Federal Republic of Germany, for example, less than half the number of supervisors required each year can be provided via the training facilities existing in the early 1960s. The remainder rise 'through the ranks' without any additional training.[2] The same is true, and to an even greater extent, for many of the middle-level personnel of the developing countries.[3]

Institutional barriers to a closer link between vocational training and general education

One of the main obstacles to attempts to create a closer relationship between vocational training and general education is at the institutional level. Indeed, many countries preserve administrative structures dating from a period when the need for a link between vocational training and general education had not yet made itself felt. Attempts at integration thus run into difficulties of interdepartmental co-ordination—and sometimes even rivalry. The two cases which follow serve to illustrate the situation, but many other countries could provide similar examples. According to a United Kingdom author, the Industrial Training Act of 1964, which should have put an end to the conflict between practical training and theoretical education, in fact intensified it by drawing a clearer dividing line between the responsibilities of the Ministries of Labour and of Education. It would appear logically difficult to respect such a frontier, in view of the vast 'no-man's-land' of vocational and technical education, for which either of these ministries might be responsible. No education system which divides responsibility for theoretical

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1. See above, Chapter 3, page 59.
2. Hoffmann, op. cit.
3. *Technical Expert Meeting on Development of Managerial and Entrepreneurial Resources in Africa*, ..., op. cit.

and practical training (or for general education and vocational training) between two ministries can be as efficient as a system which places them under a single central authority.[1]

In the U.S.S.R., the traditional role of the general secondary school as sole provider of general education at (senior) secondary level was increasingly called in question towards the end of the 1960s. Universally accessible general education at (senior) secondary level cannot be identified solely with general education of a largely theoretical nature designed primarily to prepare pupils for an intellectual career. General education to this level, involving ten years of schooling, would be open to a far greater number of pupils if it were also provided in vocational-technical schools and 'technicums', but collaboration to this end between the three types of establishment is seriously hampered by the fact that each falls within the jurisdiction of a different ministerial department, and is thus isolated from the others: in consequence, the general secondary schools have, for instance, been unable to draw upon the experience, equipment or personnel (teaching staff) of the vocational-technical schools when organizing their programmes of production training.[2]

New institutions designed to break down the barrier between vocational training and general education

In a number of countries, new institutions have been established with the aim of breaking down the barrier between general education and vocational training. In others, existing institutions have been reformed in order to establish closer links between the two elements. We shall first examine three of the newly established institutions, in the Philippines, Yugoslavia and Algeria.

In the Philippines, community schools combining vocational training with secondary general education have been set up in rural districts and suburban areas. The initial objective of these schools was to provide country children who had no opportunity of attending secondary education establishments in the towns with training for employment and higher studies; later developments led to the creation of more advanced education establishments, known as community colleges, open not only to graduates from the secondary schools, but also to adults, for whom courses of further vocational education are provided, with a certificate obtainable on graduation. The community schools are financed for the most part by the local population, grouped together for the purpose of meeting the costs of teachers' salaries, equipment, etc. The pupils themselves also contribute to their financing through work carried out as part of their vocational training. Significant results have already been obtained in these establishments, which were opened in 1964 and which by 1969 numbered about 1,500. In areas where the schools have been functioning for some time, wastage at the primary level has fallen by 20 per cent, the pupils of primary schools being encouraged to persevere in their studies by the fact that they will be able to continue with secondary education and vocational training at the community schools. The latter have also made a considerable contribution to the improvement of rural health, to increased productivity and to a reduction in juvenile delinquency. This idea of rural community schools would appear eminently suited to conditions in the developing countries and might eventually offer an advantageous alternative to certain literacy and education campaigns for adults.[1]

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[1] John Wellens, 'The Linking of Technical College Courses with Industrial Training', *Technical Education and Industrial Training* (London), Vol. 6, No. 9, September 1964, p. 436–8.

[2] Nemčenko *et al.*, op. cit.

In Yugoslavia, a balance between vocational training and general instruction characterizes the curriculum provided in the 400 workers' training centres and 240 workers' universities.[2] With enterprises playing an increasingly important role in the educational system, general education for workers had been somewhat neglected in favour of purely vocational training; but this situation was transformed by the participation of workers in production planning and management in their enterprises, as well as in the organization and supervision of the educational system. Joint action by 'worker-managers' and unions led to the creation of workers' training centres and workers' universities. This sharing of responsibilities has provided safeguards against one-sided training, by ensuring that subjects of general, professional and socio-economic interest figure on the same footing in the curricula.[3]

In Algeria, the so-called centres of vocational and cultural training (CFPC) are making a major contribution to the development of general education for adults. The establishment and organization of these centres was the subject of a ministerial decree dated 6 October 1964. The centres admit pupils who have passed normal school age, provided that they have received the equivalent of a complete primary education. Evening courses in premises used during the day by primary and secondary schools are given by primary and secondary teachers, engineers and students, whose services are for the most part provided free of charge. The director of each centre is assisted by a board of management composed of elected representatives of the student body and teaching staff, an inspector, and representatives of the Party and of the trade union organization. Teaching is centred on mathematics and the physical sciences; French is taught through the study of novels chosen for their literary and ideological value. Examinations are held at the end of each school year. Successful students become middle-level personnel, teachers or literary workers, or enter the workers' universities.[1]

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[1] P. T. Orata, 'Community Schools in the Philippines', *Prospects in Education* (Unesco, Paris) No. 1, 1969, p. 52–6.

[2] Figures valid for the mid-sixties.

[3] B. Tonkovič, 'Intensifying the Function of Enterprises in the Educational System', *Yugoslav Trade Unions* (Beograd), Vol. 6, No. 17, July-September 1965, p. 16–21.

Reforms designed to bring vocational training and general education closer together at the outset of the educational process

A number of countries have reformed existing institutions with the aim of bringing vocational training and general education closer together and raising the level attained in general education. In this connexion let us consider, by way of example, what has been done in Poland, the Union of Soviet Socialist Republics, the United States of America and Switzerland.

In Poland, the reform of the system of vocational education which became operative in September 1967 provides for new curricula in the elementary vocational schools and in technical colleges. As a result, the syllabuses used for the training of technicians must be the same as in general senior secondary schools as far as the natural sciences are concerned and very similar as far as language and literature, civics and pre-military training are concerned. The teaching of history and geography, although occupying a smaller place in the curriculum than in general secondary schools, must receive due importance. Similarly, one foreign language (instead of two) must be taught in technical colleges. This harmonization of the curricula of technical colleges and general senior secondary schools, designed to place technical and vocational training on a more scientific footing, will also ensure that workers graduating from these two types of secondary educational establishment will form a single and intellectually uniform group in society.

In the elementary vocational schools, the general education provided will in principle be a continuation of that provided during the eight years of compulsory schooling, but will be adapted so as to facilitate acquisition of the various trades (through a judicious measure of teaching in the basic sciences), and will also be angled towards a deeper understanding of economic and social processes. This level of general education will in future be regarded as the basic minimum for skilled workers, farmers and workers in the public services.[1]

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[1] I. G. Zuev, 'Les Centres de Formation Professionnelle et Culturelle—Étape vers les Universités du Travail', *Révolution Africaine* (Algiers), No. 111, March 1965, p. 4–5.

In the U.S.S.R., following a joint decision by the Central Committee of the Party and the Council of Ministers, training for a number of highly skilled manual professions must be accompanied by general education up to the secondary level. The relevant studies in the vocational-technical schools concerned will lead up to the award of a certificate qualifying workers for a particular professional category and certifying that they have received general education to this level.[2] However, this reform had to be carried out in such a way as to ensure that the professional skills acquired in the reorganized schools did not fall below the standard reached in vocational-technical schools which did not provide general education. In order to avoid an excessively heavy time-table, the syllabus of general education was not merely appended to the existing curriculum. All the general subjects were analysed from the point of view of their relevance to the training in question, in order to determine what parts of their subject-matter should be included in the syllabus, the order in which they should be taught and the relative importance to be accorded to each—so that this general education might be better integrated with the training programme and made subservient to its requirements. For turners and other mechanical trades, for example, the analysis produced the following model curriculum: a total of 4,929 hours (38-39 per week), 62 per cent of which were set aside for vocational training, 35 per cent for general education and 3 per cent for consultations and examinations. Basic sciences accounted for more than half of the time allotted for general education: 430 hours being taken up with mathematics, 202 with physics, 178 with chemistry, 69 with biology and 17 with astronomy. The remaining 834 hours were shared between Russian language, literature, history, civic instruction, geography and a foreign language.[3]

In a new type of technical and vocational training, introduced experimentally at Pittsburgh in the United States in 1965, vocational and secondary schools are merged into expanded, 'comprehensive' schools providing both vocational and technical (theoretical) education, and general education. The goal is a functional education system which will provide pupils with training designed to meet the requirements of the economy, without sacrificing the indispensable element of traditional general schooling. The outstanding feature of this system is its flexibility: pupils may pass easily from one technical and vocational syllabus to another or—if required—to a traditional general syllabus. From the seventh to tenth grades of school, they follow an experimental general syllabus and also get preliminary orientational guidance designed to help them make their final choice of field of study in eleventh grade.[1]

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[1] S. Dobosiewicz, 'Niektore Problemy Reformy Programowey Szkolnictwa Zawodowego' (Problems Concerning the Reform of Vocational Training Curricula), *Nowa Szkola* (Warsaw), No. 2, February 1967, p. 2–8.

[2] I. G. Zuev, 'O Merah po Dal'nejšemu Ulučšeniju Podgotovki Kvalificirovannyh rabočih v Učebnyh Zavedenijah Systemy Professional'no-tehničeskogo Obrazovanija' (Concerning Measures for the Improvement of Training for Skilled Workers in Vocational-technical Schools), *Professional'no-tehničeskoe obrazovanie* (Moscow), Vol. 26, No. 5, May 1969, p. 1–3. See also: Sokolov, op. cit.

[3] E. Morozov, 'Voprosy Organizacii Učebnoj Raboty v Proftehučiliščah Novogo Tipa' (The Organization of Studies in the New Type of Vocational-technical Schools), *Professional'no-tehničeskoe Obrazovanie* (Moscow), Vol. 26, No. 8, August 1969, p. 8–10.

In Switzerland, apprenticeship is increasingly becoming a stepping-stone to middle-level posts, with the result that the general education provided up to now for apprentices is considered inadequate. In consequence, a new type of vocational school, designed to raise the general educational level of apprentices, is being created. These advanced vocational training schools

> provide a wider range of theoretical education for competent male and female apprentices in all trades. This education supplements the standard vocational training school curriculum, and is designed to broaden vocational training and develop the general culture of the pupils.

The advanced vocational-training school is divided into three sections: general section, technical section and arts section.

The training course lasts six terms, each of which generally comprises twenty weeks of classes. Teaching is divided into: compulsory major subjects for all sections (mother tongue, 160 hours; first foreign language, 160 hours, contemporary history, 60 hours); compulsory specialized subjects for each section; optional subjects available in all sections.

Pupils in each section spend ten hours of classes 'learning to learn'—an initiation in methodology which is periodically revised by the teachers.

In some, if not all cantons, teaching duties at the advanced vocational training schools will be shared between staff from the ordinary vocational training schools and staff from gymnasia or other establishments of secondary education. In this way the advanced vocational-training school will make a valuable contribution to breaking down the barrier between different types of establishment.

According to present plans, about 5 to 7 per cent of all apprentices will attend these new schools. At a later stage it is planned to admit graduates from such schools, without examination, to higher technical schools.[2]

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[1] J., Olson, 'The Marriageability of Vocational Education', *School Shop* (Ann Arbor, Mich.), Vol. 25, No. 2, October 1965, p. 39–42.

[2] Switzerland, Office Fédéral de l'Industrie, des Arts et Métiers et du Travail, *Directives Concernant l'Institution et l'Organisation des Écoles Professionnelles Supérieures ainsi que leur Subventionnement par la Confédération*, Berne, Ofiamt, 26 June 1970, 7 p. (mimeo.).

The changing relationship between vocational training and general education

Most of the trends examined in this chapter point to an increasing effort to transcend the antithesis between vocational training and general education by setting up institutions in which both types of teaching are combined. In a broader perspective, this effort should be seen as part of the attempt to bridge the gulf between manual and intellectual work.[1]

In the long term, the solution to the problem of the relationship between vocational training and general education—with regard not only to middle-level personnel, but at all levels—will doubtless have to be sought within the context of such concepts as lifelong education, recurrent education, the individualization of education and group teaching.[2]

The application of these new concepts is exemplified by the work of the Polyvalent Adult Education Centre in Bombay (Shramik Vidyapeeth) which was developed in close co-operation with Unesco. This is a new type of adult education institute intended to meet the multiple educational needs of the working man and woman. Programmes are designed to meet the specific requirements of different groups of workers and include general, technical, cultural and civic education.

The work of the centre is based on the principle that educational opportunities should have no termination point, but be available over the whole period of the worker's life. The main emphasis is on 'functional needs'—those which will improve the individual's situation as a worker by providing education and training related directly to job requirements. The objectives are twofold: meeting the educational needs of the workers and increasing their productive capacity. The integration of general education into the technical and vocational training programmes required by the worker is one of the new aspects of the centre's work, as is its concentration on needs. These needs are assessed through surveys, interviews and questionnaires which endeavour to obtain basic information on industrial organization, the kinds of skills (and levels) required of workers, the existing educational and training programmes as well as the worker's own interests, etc. Programmes are thus structured on the basis of these investigations and attempts are made to co-ordinate the participant's needs and wishes with those of the socio-economic community. As a

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1. In this connexion, we may note the work undertaken by the Centre Universitaire de Coopération Économique et Sociale (CUCES), at Nancy (France).
2. For a proposed structure based on these concepts, see, for example: Armin Gretler, Daniel Haag, Eduard Halter, Roger Kramer, Silvio Munari and François Stoll, *La Suisse au-devant de l'Éducation Permanente*, Lausanne, Payot, 1971, 179 p. (Collection *GRETI-Information*). See also in this connexion the work of the Swedish Committee 'U68', on recurrent education, covering both youth and adult education (cf. Swedish Ministry of Education, *Press Communiqué*, p. 3, op. cit.).

result, courses are flexible and of varying duration. Instructional materials are specially prepared for each course and the 'trainers' are drawn from specialists in a given field (engineers, technicians, etc.) rather than full-time teachers. These specialists are given orientation courses in adult education methodology. The centre is therefore not a formal school, but an institute which designs courses geared directly to educational needs and makes provisions to train and supply the specialist teachers at a place and time convenient to the workers involved.

In keeping with the principle of 'developing the full personality of the member' and stimulating his participation in the life of the community, the centre's activities go beyond the provision of technical training and general education. Social and cultural activities are organized and an attempt is also made to stimulate the interest of workers attending technical courses in questions of cultural and civic interests.

Attempts are made to evaluate the methods and effectiveness of the teaching as well as the theory and practical operation of the centre. This aspect of the work has been done in close collaboration with the Tata Institute for Social Sciences.

Chapter 7

Trends and prospects

It is not intended here to forecast all the possible developments in the training of adult middle-level personnel, but simply to indicate certain socio-economic trends and new practices which are emerging in a continually changing situation.

The scientific and technical revolution has already brought about fundamental changes in socio-economic life—resulting in both qualitative and quantitative changes in the work force and involving a substantial shift from manual to intellectual skills. Although this is still not a universal pattern, the changing nature of functions, the wide classification of jobs and the growing mobility of labour, require that workers should have a new and broader basis of education in order to respond more readily to these changes. In fact, more education is increasingly becoming a precondition for earning a livelihood. In the highly developed industrial countries another important change is the movement of workers away from the primary and secondary to the tertiary and latterly to the quaternary sectors. The greatest shortage of trained personnel at this level is perhaps to be found in certain developing countries where industrial development has had its biggest impact in the last two decades. In many of these countries the education systems inherited from colonial *régimes* still need considerable reorientation before they can fulfil their role in economic and social development.

It is clear, therefore, that the organization and provision of training will have different points of emphasis depending upon the economic and social conditions within the areas and regions concerned.

Certain patterns are nevertheless emerging in the light of these changes, which are perhaps worthy of comment (although the list cannot be by any means exhaustive).

There is a growing recognition of the need to plan the provision of middle-level training at national level. This involves taking into account long-range perspectives and adapting the content of education to professional life, not only in the sense of specialization, but also in such a way as to provide for a sound basis of relevant general education.

A closer relationship has developed in some countries between the formal school system and out-of-school education, the subjects taught in school having been re-examined with a view to achieving a more realistic approach to the needs of technicians and administrative personnel in the context of modern industrial requirements. This has often led to a systematic prolongation of training facilities with more stress on theoretical studies and recognition of the integrated approach to training. It also involves the inclusion of a wide range of general education subjects —the natural sciences, mathematics, liberal studies (especially modern languages and communication skills) as well as subjects related to social and human aspects of work (sociology, psychology and economics). The integration of general education subjects with technical training often requires a serious reform of curricula.

Linked to this is the need to plan and structure out-of-school education both qualitatively and quantitatively (horizontal planning) so as to co-ordinate efforts aimed at integrating education authorities and the expanding educational institutions in industry. There is in fact a new relationship developing between the State, on the one hand, and industry and agricultural enterprises, on the other. Industrial and agricultural enterprises are becoming more and more involved in the provision of training. There is also evidence that industry plays a greater role in determining the kind of training a worker must have (either by supplying facilities on the job, or by influencing schools and special training institutions with respect to the concept of courses, syllabuses, etc.). Priorities in training are likely to become more oriented towards employment. Further, as many big industrial enterprises internationalize their production units, the kind of training given within these industries is likely to become more standardized in the countries where they operate (e.g. petrol companies, electronic groups, banking, automobile construction, etc.).

This study gives examples of the increasing legislation providing for the further training of working adults, both by the state and industry, and for recognition of the status of 'trainers' (whether full-time or part-time).

There is growing evidence (and, in many cases, legislation for this purpose) of workers spending progressively more time studying during working hours at the employers' expense rather than their own and also of enterprises offering paid scholarships for long-term further training. The next decade is likely to see an even greater development of this trend.

There is a new and growing emphasis on the tailoring of training programmes to production needs (structured systems) and away from traditional courses leading to a diploma, certificate, etc. This approach leads to a new methodology based on the analysis of training needs and the development of courses of different duration with syllabuses specifically modelled on established needs.

In many other countries there is evidence of an increasing number of part-time trainers (engineers, administrators, technicians, etc.) becoming responsible for training programmes in industries and administrations. There is also an acknowledged lack of training facilities for these trainers, but new methodologies are already being employed in some countries and research on methodological problems, although still somewhat fragmented, is on the increase.

It seems that women will be increasingly employed in middle-level supervisory capacities. This is to be seen as part of the broader movement for the emancipation of women, which implies their integration in professional life.

Educational technology, including mass communication techniques, for solving problems of middle-level training is likely to be increasingly employed, not only to help solve the problem of the shortage of trainers, but also because of its scientific potential as a training system and the growing proof that it is faster and more effective. Cybernetic techniques have evolved learning equipment which is becoming an important feature in adult education on a mass scale while its use for individual and self-study is constantly increasing.

It has been noted throughout this study that ‘job changes’, the ‘mobility of labour’ and the need for ‘recurrent education’ are increasing. This is leading to the provision of what are now called ‘modular units’, i.e. training courses presented in successive stages with curricula designed for adult needs. These units can—in various combinations—serve as the basis for courses designed to meet different requirements.

As has been indicated in reviewing these trends, the future is likely to see a greater concentration on the application of lifelong integrated education. If put into practice, the concept of lifelong education would obviously lead to a great extension of adult education. However, the gulf between adult education, on the one hand, and education and training in general, on the other, would be less marked owing to the tendency to introduce integrated education and training systems. As was indicated at the fourteenth session of the General Conference of Unesco in 1966, educational activity must come to be viewed as a whole, since such a viewpoint is better attuned to the varying requirements of individuals throughout their lives, the needs of a rapidly changing world and the nature of education itself, as the instrument *par excellence* of economic and social change; this global conception calls for an effort to bring under one system all sectors of education and all age-groups, school and out-of-school education, vocational training and general education, education in childhood, in adolescence and in adult life. One is therefore, of necessity, led to question existing educational systems. To speak of reforming the educational system is in fact already meaningless. The whole of the system needs to undergo a profound change and this must be within the general framework of lifelong education.[1] The same need for a fundamental reform of traditional education is highlighted in an article by A. Hovne on manpower planning and the restructuring of education:

> To enable developed countries to meet shortages and developing countries to deal effectively with their many manpower problems, basic changes in the conventional structure of education may be needed.

These modifications would primarily concern 'the custom of full-time study and uninterrupted progression' and would lead to a conception of life which envisaged training and productive work as integrated in one continuous process.[2]

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1. Bertrand Schwartz, quoted in: Bernard Roux, *La Formation Permanente*, cf. p. 41, Paris, Centurion, 1969, 192 p.
2. Avner Hovne, 'Manpower Planning and the Restructuring of Education', *International Labour Review* (Geneva), Vol. 89, No. 6, June 1964, p. 529–50, cf. p. 530–1.

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